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cardial infarction 12 times in eight cases. In only one case was myocardial infarction the immediate cause of death.

Evidence that prolonged periods of coronary insufficiency may occur in patients with calcific aortic stenosis without gross infarction of the myocardium is the observation that in only 4 of 49 hearts was gross evidence of healed or acute infarction found on examination. In many hearts, however, there were scattered multiple small scars. In three of the four hearts in which gross myocardial infarction was noted, severe coronary atherosclerosis (grade 3 to 4) with minor degrees of aortic stenosis (grade 1 to 2) was evident. In the fourth heart in which healed myocardial infarction was found at necropsy, severe aortic stenosis with minimal coronary occlusive disease was present. The electrocardiographic picture was diagnostic of myocardial infarction in three of the four cases in which pathological findings were positive. The electrocardiographic patterns of the four additional patients for whom a clinical diagnosis of myocardial infarction had been entertained were equivocal.

TABLE 1.—*Age and Sex Distribution of Forty-Nine Patients Who Had Calcific Aortic Stenosis**

Decades	Total No. of Patients	Men	Women
30-39	1	1	0
40-49	5	5	0
50-59	12	10	2
60-69	17	13	4
70-79	8	7	1
80-89	5	4	1
90-99	1	1	0
Total	49	41 (83.7%)	8 (16.3%)

* The average age at death was 63.4 (63.2 for the men and 64.2 for the women). The total age range at death was 39 to 93 years.

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The correlation of clinical, electrocardiographic, and pathological diagnoses of myocardial infarction in cases of calcific aortic stenosis in this small group has not been good. We have attributed this to the apparent occurrence of prolonged yet reversible myocardial ischemia indistinguishable clinically from myocardial infarction, together with the frequent presence of electrocardiographic aberrations, such as left bundle branch block, which decrease the value of the electrocardiogram when a diagnosis of myocardial infarction is attempted.

TABLE 2.—*Incidence of Degrees of Aortic Stenosis and Coronary Sclerosis*

	Angina		No Angina	
	Number	%	Number	%
Aortic stenosis, grade 3 or 4				
With coronary sclerosis, grade 3 or 4	2	10.0	2	6.9
With coronary sclerosis, grade 1 or 2	11	55.0	16	55.2
Aortic stenosis, grade 1 or 2				
With coronary sclerosis, grade 3 or 4	6	30.0	2	6.9
With coronary sclerosis, grade 1 or 2	1	5.0	9	31.0
Total	20	40.8	29	59.2

Myocardial Failure.—Myocardial failure was an extremely prominent feature. We have accepted as evidence of myocardial failure a history of increasing dyspnea with mild exertion, the occurrence of paroxysmal nocturnal dyspnea, and episodes of acute pulmonary edema, in addition to chronic congestive failure manifested by peripheral edema and hepatomegaly. Failure of the left ventricle, as expected, was the primary event in all cases of chronic cardiac decompensation.

By our criteria myocardial failure occurred in 36 of the 49 cases (73.5%), the duration of failure prior to death ranged from seven days to 11 years, and the average survival after the onset of myocardial failure was 2.2 years. Five patients survived more than five years after the onset of myocardial failure, and 14 died within one year. Further observations relating to the pathological and clinical findings in the presence or absence of myocardial failure are given in table 3. Little measurable difference was found in the two groups. In cases of myocardial failure the hearts were slightly heavier and, also, hypertension was recorded more frequently, while patients who did not have myocardial failure prior to death survived a few years longer, on the average, than the others.

Sudden Death, Syncope, and Convulsions.—The occurrence of syncopal attacks and convulsive seizures punctuating the course of calcific aortic stenosis has been described frequently. These dramatic episodes have been attributed to cerebral anoxia associated with diminished cardiac output,[5e] disturbances of cardiac conduction,[6] and hypersentitive carotid sinus.[3b] Sudden and unexpected death is likewise a peculiarity observed in these cases. In contrast to other studies in which the incidence has been considerably higher, convulsive seizures occurred in only two of our 49 cases and syncope in only three. One of the patients who had convulsive episodes had complete auriculoventricular dissociation, observed by electrocardiography, with frequent Adams-Stokes seizures, but in the others with syncopal and convulsive disturbance there was no electrocardiographic abnormality to explain the events.

TABLE 3.—*Clinical and Postmortem Observations in Patients With Myocardial Failure*

	Myocardial Failure		No Myocardial Failure	
	Number	%	Number	%
No. of patients	36	73.5	13	26.5
With angina pectoris	16	44.4	4	30.8
With hypertension	11	30.6	1	7.7
Aortic stenosis, grade 3 or 4				
With coronary sclerosis, grade 3 or 4	3	8.3	1	7.7
With coronary sclerosis, grade 1 or 2	19	52.8	8	61.5
Aortic stenosis, grade 1 or 2				
With coronary sclerosis, grade 3 or 4	6	16.7	2	15.4
With coronary sclerosis, grade 1 or 2	8	22.2	2	15.4
Weight of heart, gm.				
Average	628		595	
Range	390-995		385-905	
Average age at death, yr	62.8		65.9	

Eleven patients died suddenly. Pathological study did not reveal significant differences in hearts of these 11 patients from the hearts of the others. Nine of the 11 had severe aortic stenosis, grade 3 or 4, and one of these nine had associated severe occlusive coronary disease. The other two had severe coronary atherosclerosis with minimal aortic stenosis, which suggests that the coronary disease was responsible for death.

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6. Boas, E. P.: Angina Pectoris Calcareous Aortic Stenosis, A

General Physical Findings.—A diagnosis of aortic stenosis is easily made from findings at physical examination when all the classical physical findings, including a palpable systolic thrill and harsh murmur in the aortic area, absence of the second sound in the aortic area, and a slowly rising and falling pulse, are observed. When there is severe congestive failure with diminished cardiac output or when there is advanced emphysematous changes in the lungs, both of which obscure the characteristic cardiac findings, aortic stenosis may be overlooked.

Table 4.—*Electrocardiographic Abnormalities in Cases of Calcified Aortic Stenosis*

Type of Disturbance or Abnormality	No.
Rhythm	
Auricular fibrillation	5
Auricular flutter	1
Complete heart block	1
Terminal ventricular tachycardia *	1
Conduction	
P-R interval greater than 0.2 sec	8
Left bundle branch block	6
Right bundle branch block	2
Complete heart block	1
Myocardial changes †	
Left ventricular hypertrophy and strain	24
Diffuse myocardial damage	9
Relic of myocardial infarction	4
Digitalis effect	4
Pulmonary embolism	2

* Previous sinus rhythm.
† In some cases more than one abnormality was noted.

We have attempted to evaluate only the characteristic aortic systolic murmur, the thrill, and the aortic diastolic murmur in our series, because of the infrequency with which the clinician has commented on the pulse and aortic second sound. A clinical diagnosis of aortic stenosis was made in 38 (77.6%) of the 49 cases. Thirty-one (63.2%) patients gave histories of previous knowledge of a murmur, having known of its existence for nine months to 43 years. There was no apparent relation between the severity of the aortic stenosis and the duration of the murmur.

A systolic thrill was noted in 17 patients (34.7%). As anticipated, 15 of these patients had severe aortic stenosis, grades 3 and 4. Ten (58.8%) of the patients in whom aortic thrills were observed had angina pectoris, although only two had severe coronary atherosclerosis.

When the valvular deformity is sufficiently severe to hinder closure of the aortic valve during ventricular diastole, aortic regurgitation, with its characteristic murmur, is found. We observed the aortic diastolic murmur in 16 cases (32.6%). The incidence of symptomatic coronary insufficiency and increased cardiac weight are not greater in this group than in the group without recorded diastolic murmurs.

Electrocardiographic Findings.—As said before, one or more electrocardiograms with multiple leads were made in 47 of our 49 cases. In only five patients was the electrocardiographic pattern considered to be within the limits of normal in all respects. It is noteworthy that the average weight of the hearts in the five patients without electrocardiographic abnormality was 450 gm., whereas the average weight of the hearts for the whole series was more than 600 gm. Only two of these five patients had myocardial failure. In both, this was manifested by acute pulmonary edema leading to death. Death was attributed to metastatic cancer in two of the other three patients and to pulmonary embolism in one. Aortic stenosis was severe in four of the five, and in none was there severe coronary sclerosis. In the other 42 cases in which electrocardiograms were made varied types of electrocardiographic abnormality were manifested by patterns indicating disturbances of rhythm or conduction or myocardial injury (table 4).

Our observations revealed no constant pattern of electrocardiographic abnormality. This is in keeping with the experience of others.[7] The most frequently observed electrocardiographic variants are patterns indicative of left ventricular hypertrophy and strain and left bundle branch block. One or the other of these appeared in 30 of 47 cases (63.8%). These changes also are prominently seen in cases of other vascular lesions, such as syphilitic aortic insufficiency and arterial hypertension, which produce increased work on the part of the left ventricle. Left ventricular hypertrophy and strain, and left bundle branch block, therefore, are manifestations associated with progressive thickening of the myocardium of the left ventricle regardless of the cause.

The incidence of auricular fibrillation in our group was surprisingly small (10.2%) and somewhat less than that reported by other observers.[8] This difference may be related to selection, as we eliminated patients who had associated gross mitral disease.

Nine patients had electrocardiographic patterns that we have listed under the poorly defined term "myocardial damage," for want of a more concise term. In this "wastebasket" group are instances of low voltages of the QRS complexes in all leads, inversion of the T waves without associated abnormality of the QRS complex, and excessive slurring and notching in unipolar leads. These are nonspecific changes that also are found in the electrocardiograms of patients with severe myocardial failure due to other causes. We believe that they are representative of focal myocardial scarring related to chronic myo-

Table 5.—*Postoperative Deaths in Cases of Calcified Aortic Stenosis*

			Grade		
Age, Yr.	Operation	Survival	Aortic Stenosis	Coronary Sclerosis	Cause of Death
58	Thyroidectomy	8 days	4	1	Indeterminate; sudden death
62	Gastric resection	2 days	4	1	Shock
64	Pulmonary lobectomy	8 days	2	2	Pulmonary edema
83	Prostatic resection	3 days	3	2	Pulmonary embolus
83	Prostatic resection	3 days	1	3	Shock
59	Cholecystectomy and appendectomy	2 hr.	4	2	Pulmonary edema
61	Cholecystectomy and pyloroplasty	6 days	4	3	Pulmonary edema

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7. Dry and Willius.[1] Karsner and Koletsky.[2] Dry, T. J., and Willius, F. A.: Interpretation of the Electrocardiographic Findings in Calcareous Stenosis of the Aortic Valve, Ann. Int. Med. **13**: 143-150 (July) 1939.

8. Dry and Willius.[1] McGinn, S., and White, P. D.: Clinical Observations on Aortic Stenosis, Am. J. M. Sc. **188**: 1-15 (July) 1934.

cardial ischemia and probably poorly understood physiochemical disturbances in the metabolism of cardiac muscle.

As we previously mentioned in the section on myocardial infarction, clear-cut electrocardiographic injury patterns were variable, so that it was difficult to correlate these with clinical myocardial infarction. In some cases the classical changes associated with muscular ischemia and infarction have been obscured by conduction effects and the effects of treatment with digitalis.

Table 6.—*Associated Diseases in Forty-Nine Cases of Calcific Aortic Stenosis*

	No. of Cases
Malignant neoplasm	8
Prostatic obstruction	7
Diabetes mellitus	4
Pneumonia	3
Cholecystic disease	3
Gastric ulcer	2
Toxic goiter	2
Chronic leukemia	1
Addison's disease	1
Acute rheumatic fever	1
Bronchiectasis	1
Mesenteric occlusion	1
Gouty arthritis	1
Uremia	1
Fracture of femur	1
Asthma	1

Surgical Experiences.—Statistically significant evaluation of the risk of major surgical procedures on patients with calcific aortic stenosis is not possible from so small a group of patients, particularly since only those persons who have died are included. Nevertheless, we have an impression that surgical procedures are poorly tolerated by such patients, particularly when any degree of postoperative shock results.

Fourteen major surgical procedures involving general or spinal anesthesia were performed at the clinic on 13 of our 49 patients within the five years prior to death. Several others, as well as some of the 13 patients, had had earlier major surgical procedures, and there were also a number of minor operations involving local anesthesia and unaccompanied by significant systemic reaction.

Seven of the 13 patients on whom operations were performed failed to survive the immediate postoperative period. The survival period after operation, the type of operation, pathological findings in the heart, and the cause of death are listed in table 5. It can be appreciated that these patients, all except one of whom had either severe aortic stenosis or coronary atherosclerosis, would tolerate postoperative hypotension poorly without impairment of coronary circulation. Overloading the venous return to the hearts of these patients with parenteral fluid also is hazardous, because of the difficulty of increasing cardiac output through a rigid aortic ostium. This experience must not be interpreted as meaning that the risk of operation is approximately 50%, since many other patients with calcific aortic stenosis have survived operations.

Additional Medical and Surgical Diseases.—It is not surprising to find many medical problems unrelated to the cardiac disease among patients who have calcific aortic stenosis. As was true of our patients, the majority of patients are beyond middle life when the cardiac lesion is recognized and thus are in the age group in which other diseases frequently occur. Unrelated medical and surgical diseases were found in 30 of our 49 patients, and in many cases they were the primary reason that the patient sought medical attention. Ten patients had multiple illnesses in addition to calcific aortic stenosis. The incidence of complicating diseases in the group of 49 patients is given in table 6.

This high incidence of associated diseases is of significance both from the standpoint of the influence of the aortic stenosis on their proper handling and of the influence of these diseases on the heart. We have just stated that in seven cases a fatal outcome followed operation, in which the calcific aortic stenosis undoubtedly had a deleterious effect. The case of Addison's disease may be cited as one in which cardiac decompensation, which led to death, was precipitated by treatment with desoxycorticosterone.

Cause of Death.—Failure of heart and circulation proved to be the immediate cause of death of the majority of these patients, in spite of the high incidence of associated noncardiac disease. Certainly in many instances, however, the noncardiac illnesses were contributory and precipitating factors leading to irreversible myocardial failure. There does not appear to be, however, any significant difference in the survival age of patients with multiple illnesses as contrasted with those with essentially isolated calcific aortic stenosis. The immediate cause of death in our series was determined by careful evaluation of clinical and pathological data (table 7).

COMMENT

An accurate clinical diagnosis of calcific aortic stenosis can be made when all the physical features listed by Christian [9] are present. These include systolic aortic thrill and harsh murmur, often with a softer blowing aortic diastolic murmur; characteristic pulse; decreased or normal pulse pressure; and cardiac enlargement. He also mentioned that the lesion is predominant among older men and that it is slowly progressive, with symptoms of cardiac decompensation appearing late.

Table 7.—*Immediate Cause of Death in Cases of Calcific Aortic Stenosis*

	No. of Cases
Myocardial failure	
Chronic congestive failure	18
Acute pulmonary edema	8
Coronary insufficiency	2
Sudden death: undetermined	6*
Pulmonary embolus	4
Metastatic carcinoma	1
Postoperative shock	2
Bronchopneumonia	2
Acute cholecystitis	1
Intestinal obstruction	1
Barbiturate poisoning	1
Total	49

* Includes two patients who died with convulsive seizures.

Actually, such clear-cut findings cannot always be elicited and the clinician must be satisfied with less evidence on which to base his diagnosis. Roentgen

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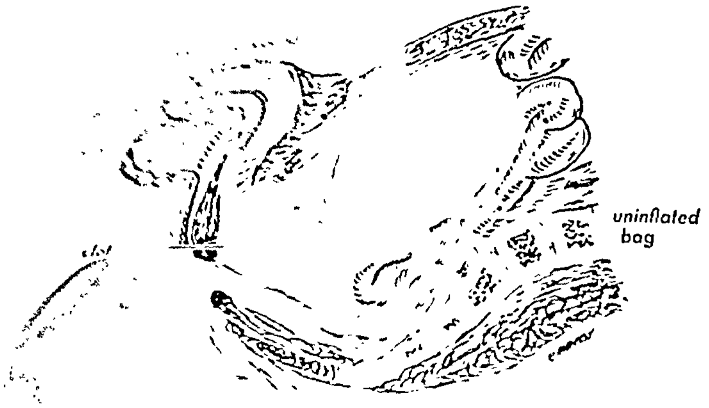
[9] Christian, H. A.: Aortic Stenosis with Cal [illegible] Clinical [illegible] J. A. M. A. 97: 15

[illegible] urinary [illegible]

[illegible] catheter- [illegible] solution may [illegible] rupture [illegible] has little value [illegible]

[illegible] cystourethrogram. [illegible] urography may be [illegible] iodomethamate (neo- [illegible] iodopyracet [illegible]—or, if [illegible] can always be ob- [illegible] of 15% strength [illegible]

[illegible] cases. [illegible] problem of [illegible] objectives: first, [illegible] extravasated urine [illegible] to the patient as [illegible] the patient's future [illegible] the continuity of [illegible] the saving of life is [illegible] the importance of this [illegible] obscure the almost equally [illegible] the patient's future well-



[illegible] membranous urethra with blood in the perivesical [illegible] her bag is in place.

[illegible] there was justifiable reluctance to [illegible] ration changes a simple fracture [illegible] ure. However, with the many anti[illegible]otics at our disposal now, we need not be afraid of this, and there need be no hesitation about operating. The perineal route gives excellent exposure and makes end to end suture of the urethra easy. However, it is contraindicated under the circumstances and undesirable for other reasons in most instances. It is time consuming and it necessitates flexing the thighs, with the further displacement of the fragments of the pelvis, which may cause more soft tissue damage. Furthermore, it is undesirable in young men or boys because possible damage to the nerves of the pelvis may cause impotence, which, indeed, may result from the fracture itself. Moreover, not all surgeons are skilled in perineal surgery.

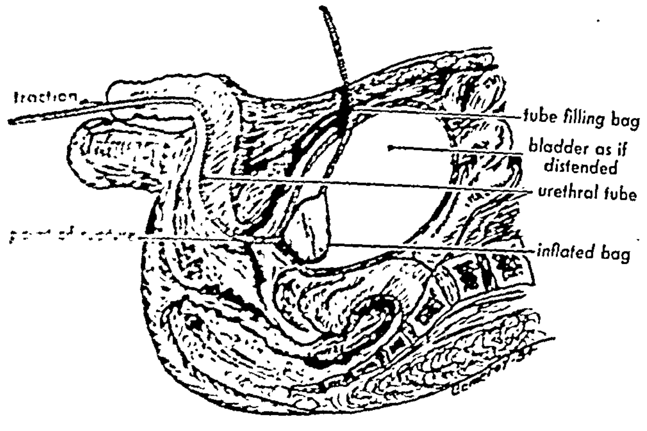


Fig. 3.—Pilcher bag inflated and prostate drawn down into apposition [illegible] membranous urethra.

The easiest, quickest, least traumatizing, and very effective procedure for the accomplishment of both objectives is by the suprapubic route.[2] This permits drainage of extravasated urine and of blood and permits the introduction of catheters or other instruments under the guidance of the eye and hand, by which the continuity of the urethra can be reestablished. It may not be possible to suture the ends together, but, by means of a Pilcher bag or a Foley catheter, traction can be applied in such a way as to keep the severed ends of the urethra in contact until healing takes place. It is not enough merely to introduce a catheter as a splint or guide as is often done. We believe the traction to be an important part of the treatment, for, if healing of the urethra takes place over even a short gap, the groundwork for a stricture is laid.

We advocate that a suprapubic incision be made and the bladder exposed and opened. There will usually be found a mixture of blood and urine deep in the space of Retzius and surrounding the prostate, pushing both bladder and prostate upward. If a Foley catheter is to be used, it can then be passed through the urethra and guided into the bladder by means of a finger or sound thrust into the prostatic urethra through the open bladder; or a sound may be passed and guided in a similar manner, and by means of it, a Pilcher bag introduced. When the bag (Foley or Pilcher) is distended with water, traction will bring the neck of the bladder and the prostate down into apposition with the triangular ligament, and the severed ends of the urethra will be in contact. The whole procedure can be done rapidly and with a minimum of disturbance to the patient. After 10 days or so, the catheter or bag can be removed. After this, sounds should be passed at intervals for a few weeks (fig. 2, 3, and 4).

[illegible] t of Complete Rupture of the Posterior [illegible] Anastomosis, J. Urol. [illegible] (April)

This method was first described by Ormond and Cothran in 1934.[3] Since then success by this method has been reported by Rexford,[4] Sewell,[5] Mason and Ratliff,[6] Simpson-Smith,[7] and Reynolds.[8] Leadbetter [9] devised a method by which traction can be applied by means of sutures introduced into the apex of the prostate and brought out through the perineum, and has since sutured the ends of the urethra together through the suprapubic exposure. We believe, however, that the method we describe requires less time and skill and is equally efficacious.

Some of the cases of rupture of the urethra at the apex of the prostate reported herein illustrate the results of this method of treatment, and others, the evil results of neglect, delay, or wrong treatment.

REPORT OF CASES

Case 1.—The patient as a young boy was run over by an automobile, with a resultant fractured pelvis and ruptured urethra with extravasation of urine. Suprapubic drainage and cystostomy were done, as a lifesaving procedure, but no attention was paid to the urethra. He passed all his urine through the cystostomy for several years. He was then taken to a urologist, who operated by a combined approach, both suprapubic and perineal, and was able to restore the continuity of the urethra. Since 1928 the patient has been under our care and must have the resulting stricture dilated frequently. He has had episodes of infection, and once had to have the bladder opened for a short time. His sexual power is normal. He works and is in good health but as stated above is compelled to have regular (and painful) dilatation of the deep urethra.

Case 2.—The patient, a 26-year-old man, was admitted a year after the occurrence of a fractured pelvis and ruptured urethra in an automobile accident. There had been numerous operations of various kinds, but, when he was admitted, all the urine came from a suprapubic catheter. By means of a combined suprapubic and perineal operation, we were able to establish urethral continuity. After returning home, he neglected to have dilatations done, and the stricture contracted, epididymitis occurred, and a perineal fistula developed. For 10 years he was in and out of the hospital, and, finally, his ureters were transplanted to the sigmoid.

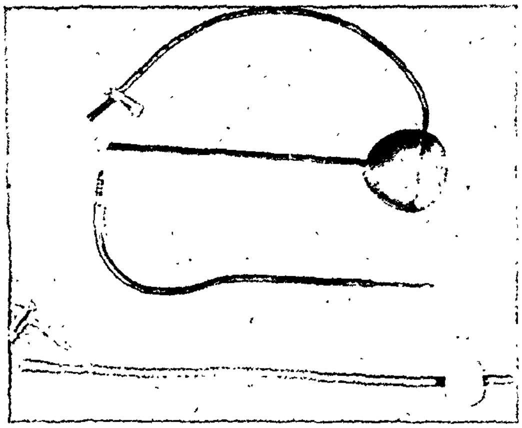


Fig. 4.—From top to bottom, Pilcher bag inflated, sound for inserting Pilcher bag, and 30 cc. Foley catheter, inflated.

Case 3.—The patient, at the age of 8, in 1942, was hit by a truck, with resultant fracture of both pubic rami and complete severance of the urethra at the apex of the prostate. Suprapubic drainage was established, the perivesical space drained, and a catheter passed into the bladder. No traction was used, and evidently the two ends of the urethra were not brought into close apposition. Healing took place, but a troublesome stricture resulted, which had to be dilated every two months or so, and caused numerous attacks of retention and cystitis. eatm required anesthesia at frequent intervals, and he had come to dread them greatly. In June, 1950, a combined suprapubic and perineal operation was done. A hard, thick band of fibrous tissue was found and as much as possible excised. He continues to require dilatation, though with much less difficulty than before. His mental condition has benefited greatly, but he will probably require treatment most of his life.

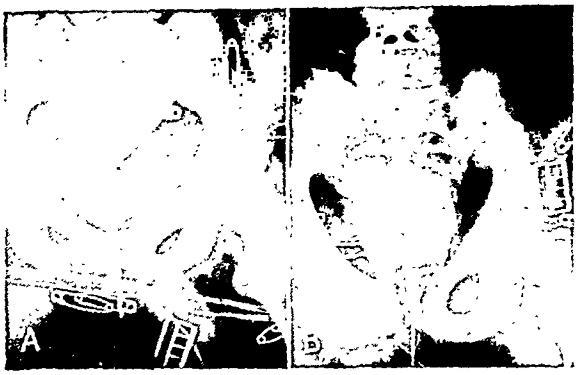


Fig. 5 (Case 6).—Preoperative cystograms, *A*, showing the bladder pushed upward, and *B*, showing the inflated Foley catheter and the bladder pulled down into normal position.

Comment.—Two of these three cases show the results of delaying treatment to the ruptured urethra. In each, drainage of the extravasation was a lifesaving measure, but delay in reestablishing urethral continuity resulted in the necessity for further surgery and in a state of permanent partial invalidism. The other case illustrates the failure of the use of a splinting catheter, without the use of traction. It must be said, however, that successes by this method have been reported.

Case 4.—This man was caught between the door and the body of his truck when it turned over and was brought to the hospital with bleeding from the urethra, extreme abdominal tenderness, and blood pressure of 60/40. X-rays showed bilateral fracture of both pubic rami. Six hours after the accident, suprapublic incision was made. Complete rupture of the urethra at the apex of the prostate was found. A sound was passed and guided into the bladder and a Pilcher bag introduced by this means. Traction was placed on the bag. Convalescence was uneventful, no stricture formed, and erections were normal.

Case 5.—The patient, a 37-year-old man, was caught between a crane and a post. Two hours later he was admitted to the hospital, cold and clammy. Blood pressure was 80/40: marked abdominal tenderness was present; and blood was dripping from the urethra. X-rays showed bilateral fracture of both pubic rami. A catheter could be introduced into the bladder. Blood transfusions were given, and a suprapubic incision was made. The urethra was found to be torn away from the apex of the prostate, and a Pilcher bag was used as previously described.

The urethral repair has been satisfactory. The patient has had several attacks of cystitis, and urethral dilatation has been necessary at those times, but he has had no permanent stricture and

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3. Ormond, J. K., and Cothran, R. M.: Simple Me Complete Severance of Urethra Complicating Fractur M. A. **102**: 2180-2181 (June 30) 1934.

4. Rexford, W. K.: Rupture of the Bladder Urine, Am. J. Surg 46: 641-648 (Dec.) 19 Genitourinary Tract, ibid. **74**: 350-358 (Sept.

5. Sewell, G.: Personal communication

6. Mason, J. T., and Ratliff, R. K.: to the Triangular Ligament: Method o 670-680 (July-Aug.) 1949.

7. Simpson-Smith, A.: Traumati sonal Cases, with a Review of War Injuries Included, Brit. J.

8. Reynolds, C. J.: Diagn ture of Posterior Urethra,

9. Leadbetter, W. F.: Urethra: Case Report J. Urol. **54**: 549-555 (

now has not been seen for over two years. He is unfortunately entirely impotent. Nine years ago Lowsley's operation for impotence was performed. At this time the ischiocavernosus muscles were found to be almost completely atrophied.

Case 6.—The patient, a 20-year-old man, was injured in an industrial accident. An hour later he was admitted to the hospital with blood pressure of 80/50. The catheterized urine was slightly blood tinged. Rectal examination showed the prostate in approximately normal position. X-rays showed fracture of both pubic rami on both sides. A cystogram showed a "tear drop" bladder riding high. Twelve hours later a urethrogram showed extravasation in the region of the posterior urethra. Suprapubic exploration 24 hours after the injury showed the prostate to be completely separated from the membranous urethra. A 30 cc. Foley bag was inserted through the urethra, guided into the bladder, and inflated. Traction was applied (fig. 5). The postoperative course was uneventful. At present, a 24 filiform follower can be passed with ease, and the patient has slight stress incontinence. Erections are reported present.

This case illustrates how misleading simple catheterization can be. The catheter showed no blood, and all the injected fluid was returned. A cystogram showed a "tear drop" bladder riding high, apparently forced up by hemorrhage, and it was not until a urethrogram was made that the injury to the urethra, drawn up as it was, was shown.

Comment.—In the three cases in which traction was used, no permanent stricture has resulted. In one the result was immediate complete restoration to a normal state. In another the state of the urethra is now to all intents and purposes normal. In the third, though the time elapsed since operation has been only a few months, there is every promise that no stricture will result.

SUMMARY

Cases of rupture of the urethra at the apex of the prostate are reported in order to show the vital importance of prompt reestablishment of the continuity of the posterior urethra when rupture of the urethra complicates fracture of the pelvis. A simple and easy method of accomplishing this is described.

SEGMENTAL GASTRIC RESECTION FOR PEPTIC ULCER

METHOD PERMITTING RESTORATION OF ANATOMIC CONTINUITY

Owen H. Wangensteen, M.D., Minneapolis

The evolution of operations for peptic ulcer is an interesting story. Pyloroplasty, gastrojejunostomy, segmental resection for gastric ulcer, antral excision based on elimination of the Edkins factor in gastric secretion, and extension of partial gastric resection to include 75% to 80% of the stomach has been the order of sequence in the development of plastic and excisional techniques in the surgical management of peptic ulcer. There are several variants of these operative procedures, concerned with variations in the technique of their performance, in consequence of which a tremendous literature has been built up around the theme of the surgical management of ulcer. Incomplete vagotomy, an old operation for ulcer employed especially as a complemental procedure to resection, has been revived by Dragstedt and his associates[1] in the nature of complete interruption of vagal influence to the gastrointestinal tract. They, too, however, have found it convenient to add to complete vagotomy a complemental drainage operation, to insure satisfactory gastric emptying.

To operate or not to operate and when to operate for peptic ulcer are still matters concerning which there is no general agreement among leaders in this area of gastroenterological interest. What operation to perform, especially for duodenal ulcer, is a question that elicits many kinds of answers, even from surgeons who profess a special interest in gastric surgery. Even in the matter of how to do the operation, there is no general agreement.

I shall not address myself broadly to all these questions in this presentation. To attempt to do so here would result only in compounding confusion. Up until recently, surgeons seemed generally in agreement on an extensive gastric resection in which the antral mucosa is completely excised, the operation being carried out on the Billroth II plan of operation, with a short, retrocolic duodenojejunal loop employed in effecting gastrointestinal continuity. The only other operation that has had any vogue is the Billroth I gastric resection, in the presence of a suitable duodenum. Then came the worldwide flurry of interest over vagotomy, which has gradually settled back in most areas to a contemplation of regret over the circumstance that so simple an operation as vagotomy should have such serious shortcomings in thwarting the ulcer diathesis. In a few areas, however, there still remains a feverish interest in vagotomy, with the belief that vagotomy continues to be the mainstay of surgical therapy for ulcer. Most surgeons who gave up gastric resection in favor of vagotomy have discarded the latter and returned to use of gastric resection. Even the keen exponents of vagotomy admit that an auxiliary drainage procedure, such as a gastrojejunostomy, is necessary to insure satisfactory gastric emptying after vagotomy. That gastrojejunostomy robs vagotomy of much of its protective action against recurrent ulcer is well documented.[2] Others have complemented gastric resection with vagotomy to augment the protection of resection against recurrent ulcer. We continue to hear occasionally echoes of the past in the voices of a few experienced present-day gastric surgeons suggesting that

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Department of Surgery, University of Minnesota Medical School.

Read before the Section on Surgery, General and Abdominal, at the One-Hundredth Annual Session of the American Medical Association, Atlantic City, June 14, 1951.

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1. Dragstedt, L. R.; Harper, P. V., Jr.; Tovee, E. B., and Woodward, E. R.: Section of the Vagus Nerves to the Stomach in the Treatment of ic Ulcer, Complications and End Results After 4 Years, Ann. Surg. : 687-699 (Nov.) 1947.

Lillehei, C. W., Lewis, J., and Wangensteen, O. H.: The Limita- of a Gastric Drainage Operation upon the Effectiveness of Vagotomy, terology 15: 487-497 (July) 1950.

gastrojejunostomy,[3] on which I thought funeral obsequies [4] had been conducted years ago, is probably, after all, as good an operation as any for peptic ulcer! These pronouncements serve to remind us that destruction of the Tower of Babel did not end the confusion of voices in many unsettled problems.

It has been proposed many times from this clinic that an operation that will protect against the ulcer provoked in the dog by histamine in beeswax is a good operation for peptic ulcer in man.[5] It is still a good instruction, but many surgeons apparently continue to believe in the empiricism of personal experience and acquaintance with all and any available methods. When will all surgeons manifest that faith in the superiority of experiment over rationalization that every follower of John Hunter professes?

AN OLD PROCEDURE IN MODERN DRESS

I hesitate to advise an operation for peptic ulcer that gastric surgeons cast off long years ago. However, I have put a new dress on this old procedure, and I believe you will find it more acceptable in this new garb. Mikulicz (1897) [6] gave the procedure the name of segmental resection but stated that the results of this operation for ulcer were so poor that he had abandoned the procedure. Riedel (1909, 1912) [7] made the first formal report on use of segmental resection as an operative procedure for gastric ulcer. Payr (1909, 1910),[8] in two papers on the subject, wrote of segmental resection with obvious enthusiasm. The procedure received strong endorsement at the German Surgical Congress in 1912,[9] save for the comment by Marquardt,[9a] who wished at least one instance of its failure to protect against ulcer recurrence recorded.[10] Then, presently, the difficulties with hourglass constriction in the stomach and delayed pyloric emptying dulled the enthusiasm of surgeons for the operation. The last good words spoken for the procedure—and that with some restraint—were by Judd and Lyons [11] at a meeting of the American Surgical Association in 1922. Most of the present generation of surgeons had only heard of segmental resection but had never seen the operation done.

A few years ago I summed up the causes of failure in the difficult technical problem presented by a large supraduodenal ulcer crater and then tried to sketch the outlines of a procedure in which the hazards of the difficult duodenal closure could be circumvented. My first thought was improvement of an earlier technique proposed for excision of the antral mucosa in the pyloric exclusion operation. A simple method of securing hemostasis with a compression ligature, drawn up rather snugly through the eye of a Mayo vein stripper, fitted with an end-plate with two compartments seemed to meet the needs of the situation adequately. Several such operations were done, and rather elaborate sketches were made of the technique. I had fully intended to publish the procedure with the artist's drawings. But amongst those rough sketches made by me to by-pass the perils of a treacherous indurated duodenum were the outlines of the segmental resection I am speaking of here. In the beginning, I believed the operation might find limited usefulness in the simple duodenal ulcer. But as my experience with the method increased it became apparent that this operative procedure was adaptable to the most difficult duodenal ulcer—the circumstance which accounted for my complete loss of interest in the exclusion operation.[12] In other words, experience with segmental resection showed that there no longer seemed to be a necessity for the performance of the exclusion operation. The most difficult duodenal ulcer craters were readily managed by the technique described herein.

Had I been thoroughly familiar with the literature on the abandonment of segmental gastric resection, it is very unlikely that I would have taken up with the method. My belief, of course, was that surgeons had repudiated the operation primarily because it failed to cure ulcer. I surmised that earlier surgeons had not removed enough acid-secreting area. My colleague, Dr. F. John Lewis,[13] has determined the size of the segmental resection in the sketches that Payr [8] used to illustrate the operation in two of his papers on the subject. Save for one instance undertaken for the correction of a gastrojejunal ulcer that gastrojejunostomy, in which 55% of the stomach was excised—as determined from the total surface area—in the remaining illustrations the size of the resection was, respectively, 28.5%, 32%, 39%, and 42.5% of the entire stomach area.

Connell (1929) [14] suggested "fundusectomy" as a likely manner of reducing the acid-secreting area of the stomach, excising a pie-shaped segment with its base at the greater curvatures from the corpus and the fundus. In his sketches shown in the papers of 1929 [14] and 1939,[15] the area of the excised corporic mucosa was, respectively, 22.8%, 34.5%, and 41.4% of the total surface area of the stomach.

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[3] Walters, W.; Belding, H. H. III, and Lillie, W. I.: Physiological and Clinical Studies of Vagotomized Patients: A Study of 331 Patients, Arch. Surg. **62**: 183-205 (Feb.) 1951.

[4] Wangensteen, O. H.: The Passing of Gastrojejunostomy as a Standard Operation for Ulcer, Journal Lancet **62**: 415, 1942.

[5] Lannin, B. G.; Hay, L. J.; Judd, E. S., and Wangensteen, O. H.: Evaluation of a Satisfactory Operation for Ulcer, Proc. Soc. Exper. Biol. & Med. **56**: 231-233, 1944. Lannin, B. G.: Experimental Evaluation of a Satisfactory Operation for Ulcer, Surgery **17**: 712-741, 1945.

[6] Mikulicz-Radecki, J.: Die chirurgische Behandlung des chronischen Magengeschwürs. Verhandl. d. Deutsch. Gesellsch. f. Chir. **26**: 31, 1897.

[7] Riedel, B.: Die Entfernung des mittleren Abschnittes vom Magen wegen Geschwür., Deutsche med. Wchnschr. **35**: 17, 54, 1909; Das jetzige Verhalten von 18 wegen Ulcus curvat. min. mit Entfernung des mittleren Theiles vom Magen behandelten Kranken, Verhandl. d. deutsch. Gesellsch. f. Chir. **41** (pt 2): 61-75, 1912.

[8] Payr, E.: Erfahrungen über Excision und Resection bei Magengeschwüren, Arch. f klin. Chir. **90**: 989, 1909; Erfahrungen über Excision und Resection bei Magengeschwüren, ibid. **92**: 199, 1910.

[9] In discussion of Reidel, B.: Verhandl. d. deutsch. Gesellsch. f. Chir. **41**(pt. 1): 162-176, 1912; (*a*) Marquardt, p. 175; (*b*) A. Bier, p. 173; (*c*) H. Kummel, p. 170; (*d*) E. Payr, p. 162.

[10] In his second paper on segmental gastric resection for ulcer, presented before the German Surgical Congress in 1912, Riedel, of Jena, stated that he had done the first operation of this type on July 10, 1901, and the second on Aug. 18, 1905. Bier,[9b] of Berlin, in the same discussion stated that he had performed segmental resection for gastric ulcer successfully in one patient 13 years previously and in another 10 years previously. Kummell,[9c] of Hamburg, stated that he had performed segmental gastric resection for cancer 16 years before. Payr,[9d] though extolling segmental gastric resection as the best operation for ulcer of the body of the stomach, stated that Hoffman (1906) of Kummell's Clinic, Mikulicz (1897), and others had observed recurrences after segmental resection for gastric ulcer.

[11] Judd, E. S., and Lyons, J. H.: Resection of the Body of the Stomach for Ulcer: Report of a Series of Cases with End Results, Ann. Surg. **76**: 409-420, 1922.

[12] Wangensteen, O. H.: Method of Closing the Pyloroantral Pouch in the Antral Exclusion Operation, Surgery **12**: 731-741, 1942.

[13] Lewis, F. J.: Personal communication to the author, 1951.

[14] Connell, F. G.: Fundusectomy; New Principle in Treatment of Gastric or Duodenal Ulcer, Surg., Gynec. & Obst. **49**: 696-701, 1929.

[15] Connell, F. G.: Problem of Intractable Peptic Ulcer, Surg., Gynec. & Obst. **69**: 287-290, 1939.

In 1940,[16] I suggested a modification of Connell's procedure, in which the entire greater curvature from the area immediately to the left of the esophagus to the antrum was excised, converting this segment into a tube. Assessment of the extent of the resection by the surface area method in figure 13 of that paper, employed to illustrate the technique, suggests that 55% of the entire stomach and 68% of the acid-secreting area was excised. I did five such operations; two of the patients had recurrent duodenal ulcers within a few years, necessitating re-resection by the conventional Billroth II method. Eight such tubular resections were performed with simultaneous complemental gastrojejunostomy.

It is clear from these computations of the surface area that, in Payr's segmental resections, in Connell's fundusectomy, and in my tubular resection, that not enough of the acid-secreting area was removed to protect against recurrent ulcer.

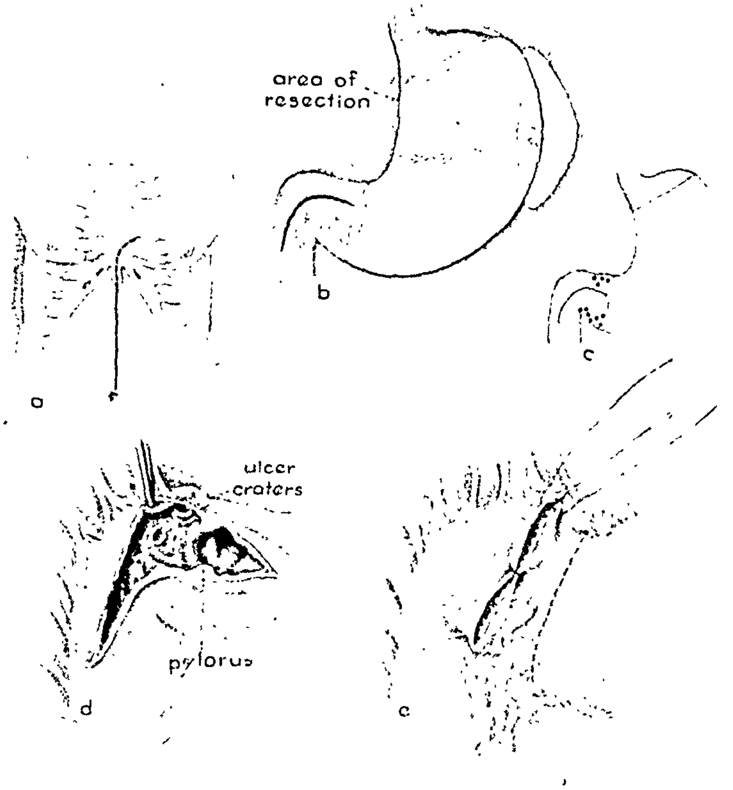

Fig. 1.—a, Sternotomy incision. b, The area of stomach to be excised. The shaded areas show the size of the residual fundic pouch and the pylorotomy incision. The light area to be excised is 80% of the entire stomach and 90% of the acid-secreting area. *c,* The maximal count of parietal cells is in the light area; in the shaded fundic zone the parietal cell count per unit of area is less; moreover, studies on isolated pouches in the dog show there is less acid secreted there per unit of area than in the corporic light zone; there are very few parietal cells in the antrum. *d,* Two ulcer craters are shown just beyond the pylorus; the long duodenoantral slit affords good visualization of the entire pyloric region. *e,* The closure of the pylorotomy incision. There are two rows of sutures. The site of application of the clamp for the distal line of resection also is sketched in.

In the revival and revision of segmental resection, I proposed preserving the pylorus and the entire antrum intact, removing the greater portion of the acid-secreting area and leaving only a small residual gastric pouch beyond the esophagus, constituting less than 10% and somewhat more than 5% of the entire stomach area. That such an operation protected against ulcer provoked by histamine in beeswax in dogs was readily ascertained, a circumstance which augured well for the ulcer-thwarting properties of the procedure. The first four patients subjected to the operation had duodenal ulcers without too much deformity of the duodenum. All these patients exhibited difficulty with gastric emptying after the operation. In the first patient, no operation was done on the pylorus. Bethanechol (urecholine®) chloride was given; the motility of her stomach improved gradually, and she weathered the inconvenience of gastric retention satisfactorily. In the next two patients, an extramucosal pyloromyotomy of the Ramstedt type was done; in the succeeding two patients, the incision was extended through the mucosa, with a longitudinal serosal closure. Even this was not enough to insure entirely satisfactory emptying of the stomach, and I began making a very long duodenoantral slit, 8 to 12 cm. in length, taking great care to observe that the incision was long enough to have divided any areas of constriction or narrowing in either the duodenum or the antrum. This rather long slit was then closed transversely. None of these patients have had any difficulty with gastric emptying, which enabled me to persuade patients who still had some gastric retention to submit to a secondary pyloroplasty on the duodenoantral segment of their stomachs.

In retrospect, it was readily appreciated that excision of a wide gastric segment had deprived the pylorus and the antral gastric fragment of its vagus nerve supply, an occurrence that neither earlier segmental resectionists nor I had taken into account. Moreover, they had used the method only for gastric ulcer; I was employing it in patients with duodenal deformities. Making a long duodenoantral slit, which when closed transversely provided a lumen as wide as the normal duodenum, resolved not only the riddle of the pyloric obstruction attending segmental resection but solved other aspects of the problem as well.

TECHNIQUE

1. *Incision.*—Figures 1 and 2 illustrate very nicely the technique of the procedure. A midline supraumbilical incision, extending to the xiphoid, suffices in thin patients. The majority of patients who come to operation for ulcer, however, have grown large around the waist, while trying to eat their way out of the difficulties of peptic ulcer. To get satisfactory exposure of the subdiaphragmatic esophagus and gastric fundus, I have added a median extrapleural sternotomy.[17] It affords easy and direct access to the attic of the abdomen. Sternotomy is simply and quickly done with a Lebsche sternum knife; it is as easily closed. In making the incision, one should be careful not to injure the pleura as the knife cuts out into the fourth and fifth interspace (fig. 1*a*).

The sternum is rewired with the placement of a few steel wires (no. 24). In men, in whom the sternum is usually wide, a few drill holes are placed; in women, in whom the gladiolus of the sternum is frequently narrow, these wire sutures may be placed about the sternal fragments with a Mayo type fascia needle. It has been gratifying to note the excellent exposure sternotomy affords and how little disability it provokes. Combined with a midline supraumbilical incision, it has come to be the incision of choice in the University of Minnesota clinic in operations on the stomach, liver, diaphragm, and spleen.

2. *Duodenoantral Slit.*—The lateral avascular ligament of the duodenum is divided. The duodenum and antrum are drawn into the operative field, and a longitudinal slit is made through the pylorus and is extended well into the duodenum and the antrum. At this juncture, I insert a curved, blunt-nosed hemostat into the

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[16] Wangensteen, O. H.: Aseptic Gastric Resection; a Method of Aseptic Anastomosis Adaptable to Any Segment of the Alimentary Canal (Esophagus, Stomach, Small or Large Intestine); Including Preliminary Description of Subtotal Excision of the Acid-Secreting Area for Ulcer, Surg., Gynec. and Obst. **70**: 59-72, 1940.

[17] Wangensteen, O. H.: An Assessment of Etiologic Aspects of Peptic Ulcer and Surgical Therapy, Including Obscure Massive Acid-Peptic Linked Hemorrhage, Esophagitis and Cardiospasm and Their Surgical Relief (The Alvarenza Lecture IX), Tr. & Stud., Coll. Physicians, Philadelphia **18**: 1-16, 1950.

duodenum and the antrum, to be certain that no areas of narrowing remain. An incision 8 to 10 cm. in length is usual; if there is considerable scarring or narrowing, I do not hesitate to make the incision longer.

Surgeons as well as roentgenologists are intrigued by the findings that this long slit uncovers. Both have learned how important it is to restudy their x-rays with greater care for evidences of small defects. In addition to a large ulcer crater or two, there may be several small superficial ulcers; this circumstance has been observed repeatedly.

Closure of the incision is begun by approximating the two far points of the incision. It is surprising how easily this long slit comes together for closure in the transverse direction (fig. 1*e*). A few mucosal stitches of fine silk (00000) are placed first, and then another inverting row of interrupted silk stitches (0000) is placed to complete the closure. If there is a large supraduodenal ulcer crater, the surgeon must place the three or four stitches at the upper end with studied care, to make certain that the closure is satisfactory. While doing so, he cannot help being reminded how very much simpler the task is than if he were attempting to effect an inversion of such a duodenum with the Billroth II type of operation (fig. 1*d* and 1*e*).

3. *Resection.*—The size of the excised fragment of the stomach is indicated in figure 1*b*. Surgeons have learned that, when the antrum is removed completely, 75% to 80% of the stomach has to be removed to insure protection against recurrent ulcer. Obviously, therefore, when the antrum is left, a larger segment must be removed. It has been my practice to leave only enough gastric fundus to make it possible to effect the anastomosis with the antrum satisfactorily. Such a fragment represents approximately 5% to 10% of the entire stomach and less than 15% of the acid-secreting area of the stomach (fig. 1*b*). In patients, as well as in dogs subjected to the histamine-in-beeswax test of the protective action of this operation against recurrent ulcer, this extent of resection appears to afford satisfactory protection against recurrent ulcer. The virtue of the histamine assay is that it assesses the merit or weakness of any proposed operation directly and quickly. Nevertheless, it will be important to know, too, whether a five-year follow-up on patients subjected to this extent of resection will verify the impression that these patients will receive absolute protection against recurrent ulcer. In the experience at this clinic, the histamine test has proved an excellent criterion for predicting the promise or detecting the defects of any operation proposed to thwart the ulcer diathesis.

Inasmuch as only the small upper fundic fragment remains "unvagotomized" by this operation, complemental division of the vagi trunk on the esophagus has been done latterly in a few patients, leaving regularly a 10% fundic pouch. With the use of the histamine test in dogs, an attempt has been made to determine how much larger, if any, the upper fundic pouch may be when the vagal trunks are divided. Those experiments indicate clearly that complemental vagotomy does not make it safe to leave a 25% residual fundic pouch when doing a segmental resection.[18] In fact, it would appear to be the better part of wisdom, as far as recurrent ulcer is concerned, not to expect too much from a complemental vagotomy on the residual fundic pouch.

4. *Anastomosis.*—The first trials with a closed type of gastric resection were made in this clinic early in 1938; by 1940, the closed anastomosis had been adopted by all our surgeons and has continued to be standard practice [19] for gastric resection in the Billroth I and II type of operation in this clinic.

Surgeons who employed segmental resection for gastric ulcer or cancer 30 years or more ago renounced the operation, in part because of the development of an hour-glass constriction at the site of suture. This phenomenon was observed also in two of my earlier patients who were subjected to reoperation. Because of this occurrence, and because the pyloroplasty is an open operation anyway, I now make the anastomosis between the antrum and the small upper residual gastric fragment by a combination of the closed and the open methods. I feel that the corners are turned in more readily by use of the closed anastomosis. A row of interrupted silk sutures is placed behind and tied. The clamps are turned over and the corner angles are dealt with by the placement of two sutures anteriorly at either end of the anastomosis, which are tied after the clamps are withdrawn (fig. 2*g*). This maneuver permits inspection of the interior of the anastomosis and the placement of a few stitches to insure satisfactory mucosal apposition. At this juncture, the in-lying gastric tube, which was pulled back by the anesthetist into the distal end of the esophagus as the anastomosis was started, is grasped and is threaded through the pyloroplasty into the duodenum. A few mucosal stitches of fine silk are placed anteriorly, and another row of sutures in the serosa completes the anastomosis anteriorly. The end stitch at the lesser curvature, which has been left long, is now pulled behind the anastomosis, and the posterior suture is rotated to bring the serosal surface into direct view, permitting placement of an additional stitch between each of the posterior row of stitches placed at the beginning of the anastomosis (fig. 2*k*).

Three or four stitches are employed to fasten the lesser curvature of the stomach to the hepatoduodenal ligament beneath the liver (fig. 2*l*). The greater omentum is removed routinely in the early part of the dissection. The colon is not fastened back to the greater curvature of the miniature stomach.

For several years I have been removing the spleen regularly in all patients operated on for peptic ulcer who give a history of hemorrhage, for it has seemed to me that there is an accompanying element of purpura in some of these hemorrhages. Moreover, in two women operated on by me several years ago for bleeding duodenal ulcer, in whom the spleen was not removed, cutaneous petechial hemorrhages as well as other evidences of mild purpura have been observed since.

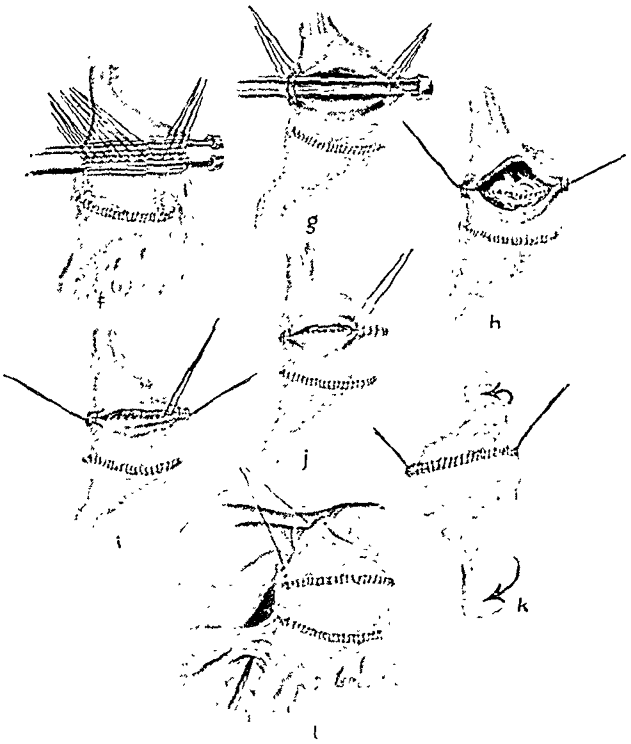

Fig. 2.—*f*, The beginning of the anastomosis following completion of the excision of gastric tissue. *g*, The clamps have been reversed and the two corner stitches at each end are placed. *h*, The pouch has been opened and a few mucosal stitches are placed. At this juncture, the indwelling duodenal tube, which during the operation was pulled back into the esophagus, is now pushed through the pyloroplasty well into the duodenum. *i* and *j*, Completion of the anterior row. *k*, Rotation of the anastomosis to permit placement of a few additional interrupted silk sutures in the posterior row, from the outside. *l*, The completed anastomosis. The lesser curvature is attached by a few sutures to the hepatic margin of the hepato-duodenal ligament.

Early in the dissection, great care is observed to preserve the vessels along both the lesser and greater curvatures of the antrum. In the upper segment, the lesser and greater curvatures are

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[18] Cross, F. S.; Ferguson, D. J., and Wangensteen, O. H.: Evaluation of Segmental Gastric Resection for Peptic Ulcer, Proc. Soc. Exper. Biol. & Med. 77: 689-692, 1951.

[19] Wangensteen, O. H.: Aseptic Resections in the Gastro-Intestinal Tract with Special Reference to Resection of the Stomach and Colon, Surg., Gynec. & Obst. 72: 257-281, 1941.

mobilized completely, severing any vessels along their margins. The only remaining blood vessels to the tiny residual upper segment are one or two vessels on the posterior wall. On a few occasions, when leaving only a 5% upper residual pouch, I have found that detachment of all the blood vessels along the curvatures left the remaining upper gastric fragment without any blood vessels, save for those coming down through the esophagus. In such instances, no suggestion of an inadequate blood supply to the tiny residual upper gastric fragment has been noted and no difficulty on this score has been encountered in the postoperative period.

RATIONALE OF THE OPERATION

The antrum itself secretes very little acid, a fact that was established by Heidenhain [20] by the employment of isolated gastric pouches in the dog, before histological verification of the function of the parietal cells by Bensley (1898).[21] Ivy and Oyama [22] failed to find acid or pepsin secretion in isolated antral pouches. With respect to the operation proposed herein, granted only a small area of acid-secreting area remains (responsive area), what harm can it do to leave the gastrin-containing antrum (effectuator area), in which little if any hydrochloric acid is secreted? In fact, I am inclined to believe that surgeons have persisted in performing the operation in the conventional manner largely because it is the easiest method by which to reduce the size of the stomach.[22a]

INDICATIONS AND CONTRAINDICATIONS

The sole contraindication for the procedure so far encountered has been the presence of an antral ulcer. Obviously such an ulcer should always be excised, lest an occult gastric cancer be overlooked. The most difficult duodenal ulcers with considerable induration, including large supraduodenal craters, have been operated on by this technique. A stenotic duodenum is not a contraindication to employment of the method. A long incision carried well into the antrum, as well as into the duodenum, and closed transversely affords adequate promise that obstruction will not ensue. The operation has been undertaken several times during the course of active massive hemorrhage. One of the distinct advantages of the procedure in bleeding duodenal ulcers is that the bleeding point can be visualized and dealt with directly. The operation has been done for idiopathic stricture of the esophagus, which is manifested by the regurgitation of acid-peptic juice into the esophagus. The operation has been performed in one patient in whom the distal half of the esophagus was almost completely stenosed, after the ingestion of concentrated hydrochloric acid with suicidal intent. Whereas initially the patient had difficulty with swallowing water, he now can eat a balanced meal. Since performance of the segmental resection, this patient's esophagus will admit a no. 30 (F) bougie. Prior to operation, it was impossible to introduce a catheter into the strictured esophagus. Recent experimental studies have shown the great vulnerability of the esophagus to injury by acid-peptic juice as well as by bile and pancreatic juice. In patients with defects at the upper portion of the lesser curvature in whom segmental resection is contemplated, but the finding of a suspicious lesion dictates the wisdom of excising all the fundic mucosa together with a few centimeters of the esophagus, I prefer to perform a Ramstedt extramucosal myotomy on the pylorus rather than a Heinecke-Mikulicz pyloroplasty. This is understandable, for the loss of the normal anatomic esophagogastric juncture in the presence of a pyloroplasty is likely to invite regurgitation of bile into the esophagus. This same course of action is advisable when the hypertonic distal esophagus together with the acid-secreting area of the stomach is excised in the surgical correction of megaesophagus.[23]

The lessons of the clinic [24] and the experimental laboratory [25] with reference to the vulnerability of the esophagus to injury by bile and pancreatic juice are impressive. In fact, esophagitis leading to severe anemia can be produced in the dog by the migration of the bile and pancreatic juice containing duodenal segment up onto the lower thoracic esophagus.[26] This esophagitis is observed, too, when the stomach is excised. A bit of gastric mucosa, the size of a penny, when swung up onto the esophagus on a vascularized pedicle, will cause an acid-peptic ulcer in the esophagus, even when the remainder of the stomach is excised.[27] This circumstance suggests the clinicians need to re-alert themselves to the great susceptibility of the esophagus to injury by chemical agents. Finally, segmental resection has added strong confirmation to the thesis that excision of the ulcer is not necessary to cure the ulcer diathesis, as some surgeons have continued to insist.

RESULTS

Sixty patients have been operated on by this method in the past two years at the Minnesota University Hospital. There has been one hospital death in the series. The patient had an intrahepatic gallbladder that was excised at the same time as the stomach segment; the patient died of biliary peritonitis, despite the presence of in-lying drains, a week after the operation. Plans had been made to do a "suction tip" exploration (fig. 3); however, because of the rather free external drainage of bile, it was not undertaken.[28] Autopsy disclosed a good deal of bile in the peritoneal cavity. There has been one additional early death in the series, the patient dying of encephalitis several months after operation.

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[20] Heidenhain, R.: Untersuchungen über den Bau der Labdrüsen, Arch. f. mikr. Anat. **6**: 368, 1870.

[21] Bensley, R. R.: The Structure of the Mammalian Gastric Glands, Quart. J. Micr. Sc. **41**: 361, 1898.

[22] Ivy, A. C., and Oyama, Y.: Secretion of the Pars Pylorica Gastri, Am. J. Physiol. **57**: 51, 1921.

[22a] The manner in which the remaining antrum invites recurrent ulcer in the conventional Billroth II operation is a question of perennial interest to surgeons. Every surgeon knows that the Eiselberg (Arch. f. klin. chir. **50**: 919, 1895) pyloric exclusion operation as well as the operation of Devine (Surg., Gynec. & Obst. **47**: 239, 1928) invite ulcer recurrence. When considering that retention of the antrum is not followed by recurrent ulcer in segmental resection performed as described herein, it becomes clear that it is separation of the antrum from the residual stomach that predisposes to recurrent ulcer. This thesis is supported too in the observations of Koennecke (Arch. f. klin. chir. **120**:537, 1922) on migration of the antrum to the terminal ileum as well as in the recent experiments of Dragstedt, Oberhelman, and Smith (A. M. A. Arch. Surg **63**: 298 [Sept.] 1951).

[23] Wangensteen, O. H.: A Physiologic Operation for Mega-Esophagus: (Dystonia, Cardiospasm, Achalasia), Ann. Surg. **134**: 301, 1951.

[24] Wangensteen, O. H., and Leven, N. L.: Gastric Resection for Esophagitis and Stricture of Acid-Peptic Origin, Surg., Gynec. & Obst. **88**: 560-570, 1949.

[25] Ferguson, D. J., and others: Studies on Experimental Esophagitis, Surgery **28**: 1022-1039, 1950.

[26] Cross, F. S., and Wangensteen, O. H.: The Role of Bile and Pancreatic Juice in the Production of Esophageal Erosions and Anemia, Proc. Soc. Exper. Biol. & Med. **77**: 862-866, 1951.

[27] Arroyave, R.; Clatworthy, H. W., and Wangensteen, O. H.: Experi- al Production of Esophagitis and Esophageal Ulcers in Dogs, Surg. **1**: 57-59, 1950.

It is somewhat early to discuss the results of segmental resection for ulcer. However, a study of these patients suggests definitely that achlorhydria to histamine is about as common (65% of instances), as it is after the three-quarter gastric resection by the Billroth II method. However, it should be remarked that this finding is probably more significant in these patients, in that the stomach does not empty so readily as it does after the conventional Billroth II operation. Whereas patients who ingest 5 oz. (150 cc.) of barium with that type of procedure frequently have empty stomachs within 10 minutes (contrasted with some evidence of barium retention within a normal stomach after 80 minutes), after the type of operation described herein, ingestion of the same amount of barium is retained within the stomach approximately 30 minutes or more. Pylorotomy, of course, robs the patient of the type of reservoir he had prior to the operation. Yet, in time, a small miniature stomach, which serves the function of a reservoir, appears to develop.

It had been my hope initially that this procedure might do away completely with the so-called dumping syndrome, which occurs rather frequently after the Billroth II operation. Whereas my results in this respect were somewhat better than were observed in the patients subjected to the Billroth II operation, nevertheless, sweating, fulness, and some qualitative food distress are observed in the early convalescence after this operation.

As a group, these patients do not seem to lose as much weight as do the patients who have undergone the conventional Billroth II type of operation for ulcer. Absorption studies of ingested fat suggest that, on the whole, not as much fat is lost in the stool as after the conventional Billroth II operation for peptic ulcer.

It is much too early to speak of definitive results. However, in patients operated on more than a year ago, it would appear that the excellent and good results are at least as frequent as they are after the Billroth II operation.[29] Only time will tell whether this procedure will come to supplant the conventional three-quarter gastric resection for peptic ulcer. No recurrences have been observed during this brief period of follow-up. Moreover, the histamine-in-beeswax studies on dogs suggests that the ulcer diathesis should be adequately dealt with by the use of the operation described herein. It is obvious that this operation can be done under circumstances that would make it impossible to do the Billroth I operation; moreover, the pyloric sphincter is completely lost in the Billroth I operation. That the pathway of the food is in a natural direction is, of course, a great gain of the operation over the conventional Billroth II operation. It is to be expected, therefore, when a review is made of a group of patients operated on three to five years previously, that the patients will be lean after segmental gastric resection probably less frequently than after the Billroth II type of procedure. Moreover, if current observations are borne out, the "dumping syndrome" will constitute less of a problem than it appears to be after the Billroth II operation. Unlike the Billroth II procedure, after which sideropenic anemias, usually mild, are rather frequent, anemia has not been observed after the segmental resection.[30] Whether this occurrence is due to maintenance of the antrum or to preservation of the normal mode of entry of the digestive secretions into the alimentary tract remains to be determined. Bohmansson (1950) [31] has pointed out that, in this respect, the Billroth I procedure is also functionally superior to the Billroth II operation.

SUMMARY

A segmental resection in which the antrum is allowed to remain and a small segment of the fundus beyond the esophagus, constituting not more than 10% of the entire stomach or 15% of the acid-secreting area, is preserved, when accompanied by an adequate pyloroplasty, is a satisfactory operation for ulcer. Such a procedure will protect the dog against the ulcer provoked by histamine in beeswax. This operation may be performed for duodenal as well as gastric ulcers located in the stomach proximal to the antrum. The procedure is particularly adaptable to large and difficult supraduodenal ulcer craters in which performance of the Billroth I procedure is not possible and in which the Billroth II operation would carry considerable hazard. Moreover, the procedure is the operation of choice in bleeding duodenal ulcers, because of the ease of dealing with the site of hemorrhage. Whether segmental resection will come to supplant the conventional Billroth I and II operations when any one of the three procedures may be done, only time will tell.

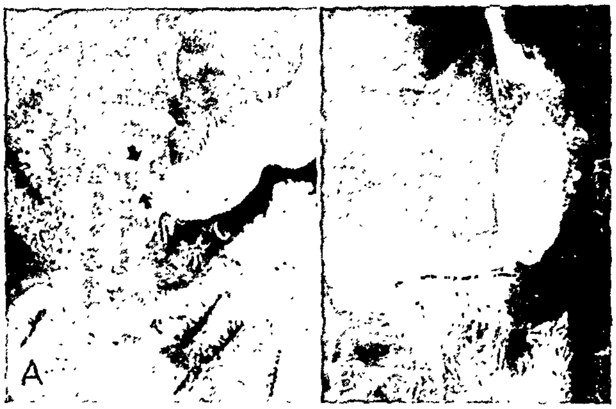

Fig. 3.—*A*, before operation. The two ulcer craters designated by the arrows were identified at operation. *B*, after operation. A little more antrum remains than is conventional. (Compare with sketches in figure 2.) The ulcer craters are healed. The patient has done very well.

Segmental resection as described herein appears to thwart the ulcer diathesis in both dog and man. When accompanied by a sternotomy incision, it is easily performed. The early results of the operation appear to compare favorably with the results of the more conventional modes of gastric resection.

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[28] Surgeons should do these "suction tip" explorations (Wangensteen, O. H.: Problems of Acute Intestinal Obstruction, Rev. Gastroenterol. **17**: 756-780, 1950) of the abdomen on lesser indications than we are accustomed to employ in patients who are not doing well after abdominal operations. It has been used over a period of three years in this clinic. It is, I believe, a useful method to detect the presence of an occult subphrenic, subhepatic, or lateral gutter abscess. In this clinic it has been the agency of saving lives. But even we, as the instance of the patient cited above suggests, do not use the method as often as we should. The method is deserving of trial, I believe, in the recognition of strangulating obstructions, pancreatic necrosis, and related conditions in which an accurate diagnosis is important and difficult to make. Moreover, in the removal of an intrahepatic gallbladder, it is always wise to insert a T tube into the common bile duct, and the employment of irrigation will help to detect a leak in the liver substance.

[29] Hamilton, W. D., and Murphy, T. O.: Unpublished observations, 1951.

[30] Kelly, W. D.: Unpublished observations, 1951.

[31] Bohmansson, G.: Prophylaxis and Therapy in Late Postgastrectomy Complications, Acta med. Scandinav. Suppl. **246**: 37-45, 1950.

J.A.M.A., May 3, 1952

SURGICAL ASPECTS OF HYPERSPLENISM

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and
Roger D. Williams, M.D., Columbus, Ohio

Certain blood dyscrasias due to splenic disease that may be amendable to splenectomy have been delineated by the hematologists. Surgery is frequently recommended in these cases, despite alarming deficiencies of blood cells or platelets that cannot be replenished to the commonly accepted safe preoperative levels. A satisfactory outcome, however, is possible if the diagnosis is confirmed by a competent hematologist and a few details of preoperative care are followed by a painstaking technique in splenectomy.

Since the surgical aspects of hypersplenism often depend on the type of blood dyscrasia, the surgeon must have a basic understanding of these disease entities in order to work effectively with the hematologist in planning the surgery as well as the preoperative and postoperative care. It is not our intention to discuss the diagnostic and prognostic aspects of hypersplenism, but it will be necessary to define the various types, as they may present problems in their individual surgical management.

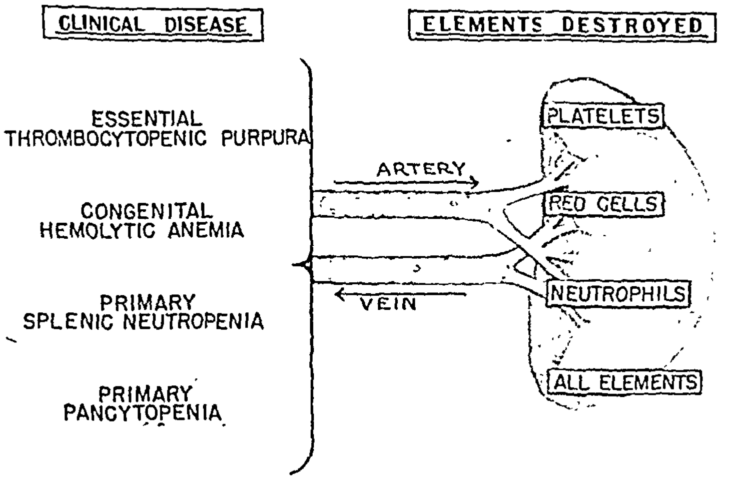

Fig. 1.—Schematic representation of one mechanism of hypersplenism (primary). The clinical syndrome is dependent on the blood element or elements destroyed.

The syndrome of hypersplenism denotes an increase in the breakdown of one or more elements of the blood by the spleen.[1] The exact mechanism of hypersplenism is debatable and is under considerable investigation by hematologists.[2] Regardless of the mechanism, specific disease entities are recognized dependent on the deficiency of the blood element or elements. Furthermore, these disease processes are classified as primary hypersplenism if congenital or hereditary and as secondary hypersplenism if they occur as a complication of a chronic disease.

In primary hypersplenism, platelets, red blood cells, or neutrophils, or all three of these elements of the blood, may be destroyed by the spleen (fig. 1). As a result, four clinical diseases are recognized. Excessive destruction of platelets results in essential thrombocytopenic purpura. The destruction of red cells in primary hypersplenism produces congenital hemolytic anemia. The more recently recognized syndrome of primary splenic neutropenia is a consequence of increased destruction of the neutrophils.[3] If all three of these elements are deficient as a result of hypersplenism, the clinical disease is known as primary pancytopenia.[4] Splenectomy in this group of diseases will usually effect a cure of the primary hypersplenic syndrome.

Secondary hypersplenism produces a clinical picture identical with that of primary hypersplenism but occurs as a complication of a number of chronic disease processes, such as chronic leukemia, Banti's disease, Boeck's sarcoid, Hodgkin's disease, and certain infections (fig. 2). For convenience we have included two more disease entities, acquired hemolytic anemia and neutropenia of Felty's syndrome, a secondary hypersplenism, although it is realized that there is no known associated complicating disease. The astute hematologist has found that, during an unsatisfactory phase of one of the above-mentioned generalized systemic diseases, there may be a superimposed overactivity of the spleen, producing secondary thrombocytopenic pupura, secondary hemolytic anemia, secondary splenic neutropenia, or secondary pancytopenia. The spleen has been proved the offending factor in the production of these cytopenias, and this phenomenon is described as secondary hypersplenism. Splenectomy may prolong life in the patient with secondary hypersplenism or establish a more favorable hematologic state; however, it will not alter appreciably the eventual outcome of the primary disease.

In the general surgical service of the University Hospital, there were 144 consecutive patients exhibiting primary or secondary hypersplenism referred by the department of hematology for splenectomy during the period April 1, 1946, to Jan. 1, 1951. There were 90 patients with primary hypersplenism and 54 patients with secondary hypersplenism. Further subdivision of the disease entities in primary hypersplenism and secondary hypersplenism is given in figure 3. Although essential thrombocytopenic purpura was seen in 55% of the cases of primary hypersplenism, thrombocytopenia was seen in only 13% of the cases of secondary hypersplenism. Hemolytic anemia was present in 30% of the primary cases and 42% of the secondary cases of hyper-

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Read before the Section on Surgery, General and Abdominal, at the One-Hundredth Annual Session of the American Medical Association, Atlantic City, June 15, 1951.

[1] Doan, C. A.: Hypersplenism, Bull. New York Acad. Med. **25**: 625 (Oct.) 1949. Wiseman, B. K.: The Spleen, Hypersplenism, and the Blood Dyscrasias, Health Center J. **1**: 21 (Dec.) 1947.

[2] Wright, C. S.; Doan, C. A.; Bouroncle, B. A., and Zollinger, R. M.: Direct Splenic Arterial and Venous Blood Studies in the Hypersplenic Syndromes Before and After Epinephrine, Blood **6**: 195 (March) 1951. Dameshek, W., and Bloom, M. L.: The Effects in the Hemolytic Crisis of Hereditary Spherocytosis, with Particular Reference to the Reticulocytopenia, Pancytopenia and an Abnormal Splenic Mechanism, ibid. **3**: 1381 (Dec.) 1948.

[3] Wiseman, B. K., and Doan, C. A.: Primary Splenic Neutropenia: A Newly Recognized Syndrome, Closely Related to Congenital Hemolytic Icterus and Essential Thrombocytopenic Purpura, Ann. Int. Med. **16**: 1097 (June) 1942.

[4] Doan, C. A., and Wright, C. S.: Primary Congenital and Secondary Acquired Splenic Panhematopenia, Blood **1**: 10 (Jan.) 1946.

splenism. The increased incidence of neutropenia in secondary hypersplenism (37%), as compared with primary splenic neutropenia (10%), was accounted for in large part by a number of cases of Banti's disease, though only those in which hypersplenism was exhibited are included. The relative frequency of pancytopenia in the two groups is similar.

The absolute prerequisite for good results of splenectomy in the hypersplenic state is the preoperative confirmation of the diagnosis. Although peripheral blood cell counts may be suggestive, bone marrow studies must be made by a competent hematologist to establish the diagnosis of hypersplenism. Caution must be exercised in the differential diagnosis, since bone marrow replacement, toxic drugs, and frequently seen industrial toxins may produce a peripheral blood pattern similar to that of hypersplenism. In hypersplenism, bone marrow hyperplasia for the specific cytopenia is always present. Further confirmation of the spleen as the etiological factor in the production of a specific cytopenia may be obtained with the epinephrine test. The diagnosis was established in each case by the hematology department prior to the recommendation for splenectomy.

Adjunct liver function studies were usually made and often were of paramount prognostic significance in cases of secondary hypersplenism. These tests included determinations of the total protein and albumin-globulin ratio, prothrombin time, serum bilirubin, alkaline phosphatase, thymol turbidity, and cephalin flocculation. Failure of prothrombin time to rise above 50% with adequate vitamin K therapy usually denotes liver involvement by a primary chronic disease process and has been found to signify a poor prognosis. Renal function studies and determinations of the cardiac and pulmonary status were made when indicated.

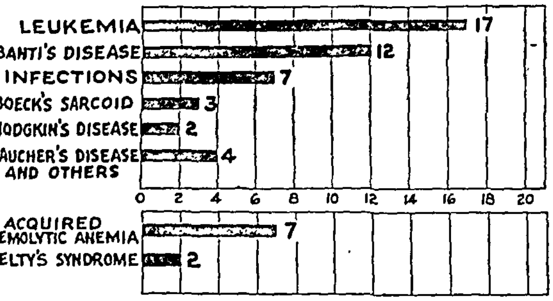

Fig. 2.—The diseases in which splenectomy was performed for associated secondary hypersplenism. Acquired hemolytic anemia and Felty's syndrome are included, although no primary associated disease is known.

PREOPERATIVE CONSIDERATIONS

The hypersplenic patient usually confronts the surgeon as a problem in preoperative management. In primary hypersplenism the patients are usually young; they averaged 22.5 years in our 90 consecutive cases. Their average vital capacity was 3,200. There was no associated debilitating disease. However, severe anemia was present in 20% of the patients at the time of operation. In contrast, the surgical risk in secondary hypersplenic patients is much greater. The vital capacity in 54 consecutive cases averaged only 2,400, and 93% had an associated debilitating disease. Sixty-seven per cent of these patients had severe anemia at the time of splenectomy. Although the average age was 30.8 years, this is readily explained by the inclusion of a number of younger patients with Banti's disease in this particular group. When the patients with Banti's disease were excluded, the average age of the remaining patients was 44 years, or twice that of patients with primary hypersplenism. In general, therefore, there was a marked difference in the general condition of the two groups of hypersplenism, since so many of the patients in the secondary group were elderly and already weakened by a chronic debilitating disease.

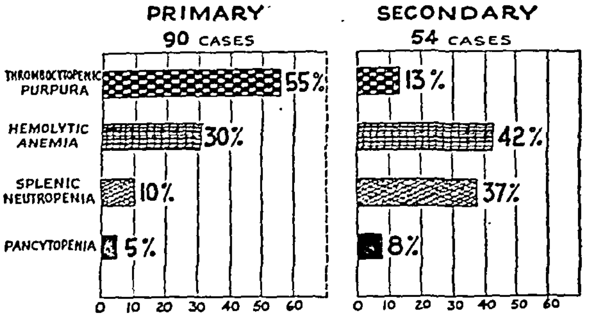

Fig. 3.—The comparative incidence of the cytopenias seen in 90 cases of primary and 54 cases of secondary hypersplenism.

Despite differences in preoperative conditions affecting surgical risk, the preparations for splenectomy in cases of primary and secondary hypersplenism are similar. Individual considerations must be given, however, to the specific cytopenias, with special preparations for patients with thrombocytopenic purpura and hemolytic anemia.

THROMBOCYTOPENIC PURPURA

In patients with thrombocytopenic purpura there is a marked lowering of blood platelets predisposing to hemorrhage into the skin, mucous membranes, and central nervous system. These patients often present an alarming situation to the surgeon with limited experience in hypersplenism. There was a bleeding tendency in 100% of our 57 patients with evidence of bleeding into the skin or from the mucous membranes (fig. 4). Furthermore, in 46% of these patients the platelet count was 0 to 10,000 per cubic millimeter at the time splenectomy was accomplished. Although fresh whole blood transfusions immediately preceding and during the operation may raise the platelet count to a limited extent, these patients must frequently be accepted for operation despite the absence of platelets. Since cerebral hemorrhage is a

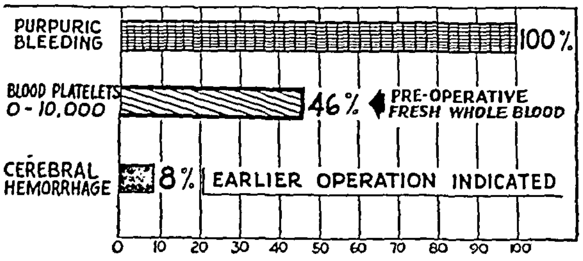

Fig. 4.—Preoperative conditions in 57 patients with thrombocytopenic purpura. The high incidence of bleeding tendency and markedly lowered blood platelets clearly shows the alarming situation encountered by the surgeon. Cerebral hemorrhage, occurring in nearly one out of 10 cases preoperatively, indicates the need for earlier operation.

lytic anemia. Second, the hematological picture almost immediately begins to improve and oozing due to low platelet levels usually stops. Third, there is probably less blood loss with subsequent steps of the operation, as a result of decreased pressure within the spleen itself. Fourth, splenic contraction ensues and provides an efficient method of providing an autotransfusion to the patient. Finally, ligation of the splenic artery results in firm contraction of the spleen with better definition of the various splenic ligaments, thus lessening the chance of rupture of the splenic capsule during its removal.

The surgeon should routinely utilize a technique of splenectomy applicable to the establishment of a venous shunt, using the splenic vein when indicated. Although rapid mobilization and mass ligation of the splenic pedicle may be advisable in the presence of a ruptured spleen, the routine use of a painstaking technique with individual ligation of vessels will pay rich dividends, regardless of the indications for splenectomy. This is important for a number of reasons: (1) to keep blood loss to a minimum, (2) to assure a clean field free of hematomas, in order that accessory spleens may be more easily identified, (3) to avoid possible injury to the tail of the pancreas or the greater curvature of the stomach, where it is intimately attached to the upper pole of the spleen, and (4) to delay ligation and conserve as much as is required of the splenic vein for a splenorenal venous shunt, which will be needed in cases of hypersplenism associated with Banti's disease.

After ligation of the splenic artery, the uppermost portion of the gastrosplenic ligament is divided and the contents of each pair of clamps ligated, in order to permit clear visualization of the entire field free of clamps at all times. After this, the spleen is retracted toward the midline and the splenorenal ligament divided. Unless there are dense adhesions or portal hypertension, it is usually unnecessary to ligate any vessels in this ligamentous attachment. Great care must be exercised during this manipulation of freeing the spleen, lest the splenic capsule be torn and excessive loss of blood occur or remnants of splenic tissue be left behind. Such remnants may persist, resulting in splenosis and the danger of possible recurrence of the hypersplenism. After the spleen has been well mobilized into the wound, the tail of the pancreas should be separated gently from its splenic attachment and any small pancreatic veins ligated. In some cases of leukemia the hilus of the spleen may be filled with lymph nodes, which tend to obscure the usual anatomic landmarks. The spleen is compressed by an assistant as firmly as possible, in order to provide the patient with the greatest amount of blood as an autotransfusion until the splenic vein is doubly ligated. The splenic vein is the last vessel in the pedicle that is divided. The contents of all clamps are double ligated with a simple tie of no. 3-0 silk proximally and a transfixing suture distally.

During the splenectomy, one or more accessory spleens are commonly encountered and often removed with the spleen. However, regardless of whether an accessory spleen has been previously noted, a careful search must be made for any persisting accessory spleen. If an accessory spleen is left in the patient, the same disease process may recur several weeks to several years later.

The locations of accessory spleens and their identifications are important to the surgeon who performs splenectomy. Accessory spleens will be found in the following places, in the order of frequency: the splenocolic ligament, the retroperitoneal space at the under surface of the tail of the pancreas, the gastrocolic ligament, the gastrosplenic ligament, the hilus of the spleen, the splenorenal ligament, the greater omentum, and overlying the left kidney. The experienced surgeon should be able to differentiate between lymph nodes, hemolymph nodes, and accessory spleens. All may be multiple in number, and, when there is any question as to the identity, they should be removed. As many as 31.4% accessory spleens have been found and reported by Curtis and Movitz.[5] They were found in 20% of our patients with hypersplenism and were more frequent (23%) in patients with primary hypersplenism.

At this time the entire abdomen is explored and the gallbladder palpated for the presence of stones. This is especially important in the patient with hemolytic icterus. Stones are frequently found and have been reported to occur in cases of hemolytic icterus with a frequency of 71%.[6] In our patients, only 18.5% were found to have gallstones. When the general condition of the patient was good, and exposure easy, we have on occasion removed the gallbladder at the time of splenectomy, but ordinarily this has been deferred.

Other essentials necessary before closure of the abdomen consist of biopsies of the liver, retroperitoneal lymph nodes, and a mesenteric lymph node. Studies of these biopsy specimens by the hematologist are of great value in the determination of the status of the reticuloendothelial system and on occasion, by the discovery of a lymphosarcoma, Hodgkin's disease, or some other primary disease, may convert the diagnosis of primary hypersplenism to one of secondary hypersplenism. In addition, should the hematological picture not improve in a satisfactory manner, a study of these biopsy specimens may enable the hematologist to make a better prognosis. This follows, since overactivity of the reticuloendothelial system in general implies that removal of the spleen cannot be counted on for certain to improve the hematological state for which the splenectomy was performed. Of special importance is the biopsy of the retroperitoneal lymph nodes. Ordinarily these are more easily found and are more readily accessible along the upper margin of the pancreas. In the majority of instances an opening is made through an avascular portion of the hepatogastric ligament, the stomach is retracted down, and the peritoneum is divided over the lymph nodes invariably present above the pancreas. A liberal portion of the nodes is removed as a specimen. It has been our experience that the diagnosis of lymphosarcoma or Hodgkin's disease is more likely to be made from the retroperitoneal nodes than from those removed from the mesentery of the upper jejunum.

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[5] Curtis, G. M., and Movitz, D.: The Surgical Significance of the Accessory Spleen, Ann. Surg. **123**: 276 (Feb.) 1946.

[6] Pemberton, J. de J., and Kiernan, P.: Surgery of the Spleen, S. Clin. North America **25**: 880 (Aug.) 1945.

Abdominal drainage is not used, and retention sutures are used only in debilitated patients with secondary hypersplenism. Three zero and four zero silk suture material is utilized throughout.

RESULTS

Satisfactory postoperative hematological results were obtained in 91% of the patients with primary hypersplenism and 64% of the patients with secondary hypersplenism. In the subgroup, acquired hemolytic icterus, only three out of seven (42%) showed good results. These figures show only an early trend, and late results lie in the field of hematology.

The surgical morbidity and mortality of splenectomy differ significantly in cases of primary and secondary hypersplenism (see accompanying table). As might be expected, the results in patients with secondary hypersplenism, though satisfactory, are not as good as those in patients with primary hypersplenism.

Postoperative recovery in most of the patients was rapid and ambulation early, except in those with longstanding leukemia or Hodgkin's disease. The average hospital stay was 10 days for those with primary and 14 days for those with secondary hypersplenism.

Postoperative complications occurred in 6.6% of patients with primary hypersplenism and 21% of those with secondary hypersplenism. Results can be closely correlated with the preoperative conditions; yet many patients who might be considered extremely poor surgical risks have undergone splenectomy with gratifying outcomes. Many of the patients with chronic leukemia, Hodgkin's disease, Banti's disease, and Boeck's sarcoid were in an advanced stage of the primary disease at the time of splenectomy. A few of the leukemic patients were almost moribund at the time of splenectomy from the combination of leukemia and associated hypersplenism, and marked improvement of the patient's general condition followed splenectomy. One patient previously reported,[7] a 24-year-old white woman with primary thrombocytopenic purpura, was seven months pregnant at the time of surgery. She had manifestations of cerebral hemorrhages with feared placenta previa, and surgery had to be done as an emergency. She recovered without incident, and her pregnancy went to term satisfactorily without recurrence of bleeding.

Results in Fifty-Four Cases of Secondary Hypersplenism and Ninety Cases of Primary Hypersplenism

	Secondary Hypersplenism	Primary Hypersplenism
Average postoperative hospital stay.....	14.0 days	10.0 days
Postoperative complications	21%	6.6%
Postoperative deaths	13%	1.1%

The most frequent complications were pneumonia, atelectasis, abdominal distention, pulmonary embolism, and myocardial infarction. Postoperative hemorrhage occurred in only two cases, in one from the upper gastrointestinal tract and in one from the tail of the pancreas. Hematoma formation in the operative site did not occur in any of the patients with thrombocytopenic purpura.

The postoperative mortality likewise has been sharply different in patients with primary and secondary hypersplenism. With primary hypersplenism, the mortality was only 1.1%, and with secondary hypersplenism the mortality was 13%. The only death in the former occurred after splenectomy in a 70-year-old white woman with pneumonia and extensive cerebral hemorrhage prior to operation; in this case surgery was performed for idiopathic thrombocytopenic purpura. In secondary hypersplenism there were seven deaths in 54 patients. One death was due to pulmonary embolus, one to myocardial infarction, one to so-called liver failure, one to gastrointestinal hemorrhage, one to anesthesia, and two to postoperative pneumonia. The seven patients comprised four with Banti's disease and three with advanced chronic lymphatic leukemia.

SUMMARY

Experience on the general surgical service of the University Hospital with 144 consecutive patients with hypersplenism over a four and one-half year period is reported. Splenectomy was performed in every case. Particular emphasis has been placed on the necessity of close teamwork between hematologist and surgeon for best possible results. Those diseases included under both primary and secondary hypersplenism are discussed from the viewpoints of incidence, age groups, special problems in preoperative care, and results.

A method of splenectomy stressing painstaking technique, with early ligation of the splenic artery and individual ligation of the vessels in the splenic pedicle, a careful search for accessory spleens, and routine liver and lymph node biopsies is outlined. The over-all postoperative mortality in this series was 5.5%; the mortality in the 90 patients with primary hypersplenism was 1.1%; and that in the 54 patients with secondary hypersplenism was 13%. It has been our experience that excellent results may be realized with splenectomy in cases of primary hypersplenism; satisfactory though admittedly poorer results may be expected in the more difficult group of cases of secondary hypersplenism.

[7] Barnes, A. C.; Wiseman, B. K., and Zollinger, R. M.: Splenectomy in Pregnancy: A Case Report, Health Center J. 3: 94 (June) 1950.

Right Rectus Rigidity.—Increased tonus of the abdominal muscles, or so-called rectus rigidity, is not a sign of acute appendicitis, but rather a sign of peritonitis. We know that it is quite impossible to contract one rectus muscle without contracting the other. Why then do we refer to the sign as right rectus rigidity when both recti contract? To correctly test for this sign the examiner must place both of his hands on the abdomen, one on each rectus muscle. With gentle pressure he determines whether or not one rectus is rigid and the other relaxed. If such a condition exists and only one rectus muscle is found to be rigid, then this suggests a mass underlying the rigid rectus. Such masses in the case of acute appendicitis would be either a localizing inflammatory appendical mass made up of appendix, terminal ileum and omentum, or an appendical abscess. When both recti are rigid it denotes a muscular defense in response to an underlying peritonitis. Should such a rectus suddenly be released the patient will wince because of so-called rebound ter (Blumberg's sign).—Philip Thorek, M.D., *The Illinois Medical Journal*, November

J.A.M.A., May 3, 1952

INFANTILE CEREBRAL PALSY

CLASSIFICATION AND CLINICAL CORRELATIONS

M. A. Perlstein, M.D., Chicago

Cerebral palsy may be defined as a condition characterized by paralysis, paresis, incoordination, dyskinesia, or any aberration of motor function that is due to involvement of the motor control centers of the brain. It should be differentiated from spinal palsies, such as poliomyelitis or transection of the cord, and from peripheral nerve palsies, such as peripheral neuritis due to lead poisoning or diphtheria. Since the brain has many functions in addition to control of motor ability, it is not surprising that in the cerebral palsied there may be many associated defects. Defects in intelligence, personality, and sensation or epileptic diatheses may coexist. In addition, there may be many sequelae of cerebral palsy, such as physical deformities due to contractures and personality defects incident to the lack of opportunity for normal social development. The present paper, however, is limited to a consideration of the classification and specific etiological correlations of the motor symptoms of cerebral palsy as they occur in the infantile forms of the condition.

Much confusion exists in the terminology and classification of the various forms of cerebral palsy. The term "Little's disease" [1] has often been used as a generic term to include all forms of cerebral palsy. Actually, what Little described was only one of the many types of the malady. The term "spastic" is often used by the doctor and layman to cover all categories of cerebral palsy. This tendency is conducive to loose thinking. A logical classification of the types of cerebral palsy would help clarify this confused subject.

Cerebral palsy may be classified according to various criteria, depending on the emphasis and viewpoint desired. It may be classified according to (1) the anatomic site of the brain lesion; (2) the qualitative nature of the clinical symptom present, whether spasticity, athetosis, rigidity, etc.; (3) the topographical involvement of the extremities; (4) the degree of tonicity; (5) the severity of involvement; and (6) the etiology. Each of these classifications has certain advantages and certain disadvantages, and it is in the overlap of the various classifications that many of the clinical correlations in the field of cerebral palsy may be observed.

I. CLASSIFICATION ACCORDING TO ANATOMIC SITE OF BRAIN LESION

Cerebral palsy may be classified according to the portion of brain that is involved and thus, presumably, responsible for the symptoms. According to this classification, cerebral palsy may be divided into three general categories:

A. Pyramidal Tract Involvement.—Clinically, patients with pyramidal tract involvement, either in cortical regions in the precentral gyrus or subcortically in the region of the internal capsule, are the true spastics (see Clinical Classification below), and the clinical syndromes are presumably due to removal of the inhibitory effects of the pyramidal tract.

B. Extrapyramidal Tract Involvement.—This covers involvement primarily, of the basilar nuclear areas and/or their connections. Clinically this classification covers patients with abnormalities of motion, such as athetosis, choreas, tremors, ballismus, dystonias, and rigidities. Presumably, the exact clinical picture depends on the specific area involved, e. g., lesions of the corpora striata may cause certain types of tremors, and lesions of the globus pallidus may cause rigidity.

C. Involvement of the Cerebellum and/or Its Connections.—Clinically this classification would include primarily ataxias and the atonic forms of cerebral palsy.

Comment.—The disadvantage of this classification is that it presumes a knowledge that we really do not have. It is based on the previous orthodox concepts of localization of function of the brain, many of which have recently been changed. Patients have been seen with the clinical diagnosis of "extrapyramidal rigidity" and the pathological finding of aplasia of the cerebellum. Other patients with athetoid and choreiform motions were found on postmortem examination to have normal basal nuclei and only cortical lesions. Thus, until further knowledge of the functions of various portions of the brain is acquired, a classification based on morbid brain anatomy can be only of didactic value.

II. CLASSIFICATION ACCORDING TO CLINICAL SYMPTOMS

This classification is based on the observable outstanding clinical symptoms and may be subdivided into (1) spastic conditions, (2) dyskinesias, and (3) ataxia.

A. Spastic Conditions.—These are characterized by the clinical signs attributed to "upper motor neurone" involvement. Specifically, there is present a stretch reflex in the involved muscle.[2] This stretch reflex is characterized by an increased tendency of the muscle to contract when it is passively stretched rapidly. This reflex is not present when the muscle is passively stretched slowly. The stretch reflex is not limited to the stretched muscle alone, but tends to spread to contiguous muscles, with the result that a mass motion of the whole extremity may occur. Electromyographically the stretch reflex can be recognized as a marked increase in the amplitude and spread of the normal action current of the muscle. The stretch reflex is more commonly found in the antigravity muscles, such as the quadriceps and gastroc-soleus group, than in their antagonists. In addition, ankle clonus, in-

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This study has been made possible in part by grants from the National Society for Crippled Children and Adults, and from the Research Society for Cerebral Palsy.

From the Children's Neurology Clinic, Cook County Hospital, and from the Cerebral Palsy Research Project of the Pediatric Department, Michael Reese Hospital.

Read before the *Section on Physical Medicine and Rehabilitation* at the One-Hundredth Annual Session of the American Medical Association, Atlantic City, June 15, 1951.

[1] Little, W. J.: On the Influence of Abnormal Parturition, Difficult Labors, Premature Birth, and Asphyxia Neonatorum, on the Mental and Physical Conditions of the Child, Especially in Relation to Deformities, Tr. Obst. Soc. London, Longmans, Green & Co., 1862, vol. 3.

creased deep reflexes, and the Babinski sign may be present. Superficial reflexes may be present or absent. In the spastic form of cerebral palsy, muscle contractures are commoner than in other forms. Convulsive episodes and mental retardation are also commoner in the spastic form, particularly in patients with marked hand involvement.[3]

B. Dyskinesias.—In this group the characteristic clinical finding is an abnormal amount and type of motion. The muscle per se reacts in perfectly normal manner so far as reflexes and muscle contraction are concerned. Electromyographically there are no abnormalities. There is marked abnormality, however, in spontaneous motion, which may be totally increased, totally decreased, or simply aberrant in nature. The two main factors that are responsible for these abnormalities of motion are (1) the tendency for motions to be uncontrollable, involuntary, and incoordinate and (2) the tendency for various degrees of tension or rigidity to occur during the performance of these motions. As a result, bizarre patterns of motion may appear, some of them rapid and jerky, some slow and worm-like, and some extremely slow and hypertonic. The motions may be unpredictable, or they may be rhythmic in character and of various amplitudes. Although many names have been given to describe some of these characteristics, there is no clear-cut line between these various forms, which merge imperceptibly into each other and which may vary in a given patient from day to day.

1. Choreas: These are characterized by involuntary, uncontrollable, sudden, jerky, unpredictable, purposeless, and random movements, rather rapid in nature. In this form it is the hyperkinesia rather than the hypertonicity that predominates.

2. Athetosis: This type of motion differs from that of chorea in that it is associated with more tension. As a result, the motions are slower and more writhing or worm-like than those of chorea, but like those of chorea are involuntary, uncontrollable, unpredictable, and generally purposeless. When the characteristic of the motion is that of a large amplitude or flailing motion, the term ballismus is often employed.

3. Dystonia: In this type of motion, the outstanding symptom is the tension. The muscles are markedly hypertonic, with the result that the involuntary motions are very slow, to the point that the patient may assume tonic postural attitudes. In this type the axial musculature is more involved than that of the limbs.

4. Tremors: These are uncontrollable, involuntary motions of a rhythmic alternating or pendular pattern. They are due to alternate agonist and antagonist contractions.

In the above forms of dyskinesia the involuntary motions and the hypertonicity are diminished when the patient is asleep or at rest and are increased on attempts at voluntary motion. In these patients voluntary attempts to move a single extremity may be associated with an initiation or aggravation of involuntary motions in the other extremities (athetoid shift). However, the reciprocal agonist and antagonist relationship between the muscles is maintained, so that relaxation in the antagonist accompanies contraction of an agonist muscle.

5. Rigidity: Extrapyramidal rigidity is characterized by disturbance in the agonist-antagonist relationships. There is resistance to slow passive motion of both agonist and antagonist muscles. This resistance is greater to slow than it is to rapid passive motion, a clinical finding that is diametrically opposed to that found in the spastic muscle, where the greater resistance is to rapid motion. Rigidity differs from spasticity also in that the antagonists to the antigravity muscles are involved most. The outstanding clinical finding in rigidity is the hypertonicity of the muscle rather than the excessive motion. In fact, in rigidity, total motion may be decreased.

At times, the resistance to passive motion in extrapyramidal rigidity is continuous, simulating the sensation of bending a lead pipe. This is referred to as the "lead pipe" type of rigidity. At other times there may be a discontinuous type of resistance, simulating a cogwheel type of action, and therefore designated as "cogwheel" rigidity. As with most forms of dyskinesia, the degree of rigidity may vary from time to time, being marked at one instant and not discernible at the next instant. The term "intermittent rigidity" denotes this characteristic.

C. Ataxia.—The outstanding symptom in patients with this condition is a disturbance in sense of balance and equilibrium. Dyssynergias, past-pointing, and intention tremors are frequently present. The patient often exhibits the "rebound phenomenon," with inability of the antagonist to stabilize a joint after sudden release of resistance to an agonist. Stereognosis and depth perception may be involved. In addition, there may be loss of muscle tone, so that atonia or hypotonia may be present. Although ataxia is due presumably to involvement of the cerebellum and/or its tracts, it is possible for certain higher brain lesions to be associated with forms of ataxia. Likewise, some of the conditions that are clinically rigidity, or even spasticity, may be due to cerebellar lesions, involving motor excitatory and suppressor regions in the cerebellum.[4]

Spasticity and ataxia usually appear as pure clinical syndromes, but the various forms of dyskinesia may occur together in the same patient, one form predominating one day and another the next. Although there may be mixed cases in which spasticity, athetosis, and ataxia may coexist, such is the exception rather than the rule. This may be due in part to the predilection of certain etiological factors to cause specific lesions, and in part to the fact that a lesion, to cause mixed clinical symptoms, might be so extensive as to be fatal.

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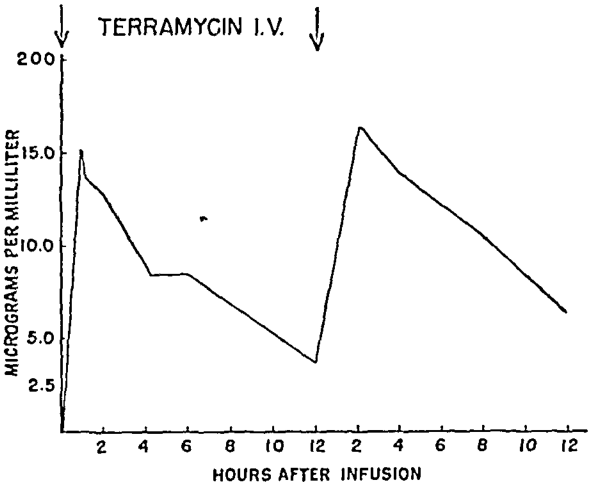
2. Magoun, H. W., and Rhines, R.: Spasticity: The Stretch-Reflex and Extrapyramidal Systems, American Lecture Series No. 9, American Lectures in Physiology, Springfield, Ill., Charles C Thomas, Publisher, 1948.

3. Perlstein, M. A.; Gibbs, E. L., and Gibbs, F. A.: The Electroencephalogram in Infantile Cerebral Palsy, Proc. A. Res. Nerv. & Ment. Dis. 26: 377, 1946.

4. Snider, R. S.: Recent Contributions to the Anatomy and Physiology of the Cerebellum, Arch. Neurol. & Psychiat. 64: 196-219 (August) 1950; Recent Contributions to Our Knowledge of the Cerebellum, Monthly Research Report of the Office of Naval Research, Department of the Navy, p. 15 (Aug. 1) 1950.

hours) blood levels of 4 γ per milliliter were obtained for one to four hours after the initial dose, and levels of approximately 2 γ per milliliter were maintained thereafter. These data are in substantial agreement with those reported by Welch and associates. Adequate therapeutic blood levels can also be obtained by giving terramycin hydrochloride intravenously in 1 gm. doses every 12 hours (see figure).

Herrell and co-workers[10] found no appreciable levels of terramycin in the spinal fluid after giving 1 gm. of the drug every six hours for 24 hours and concluded that terramycin, unlike aureomycin, does not readily traverse the blood-brain barrier. Their investigations, however, were carried out on patients free from meningeal diseases. We found terramycin levels of 3.84 γ per milliliter in the spinal fluid of a patient with meningitis who received 1 gm. of the drug intravenously every 12 hours. The meningitis in this case was secondary to a post-pneumonic empyema, and the causative organism, a gamma Streptococcus, was sensitive to terramycin in vitro. The patient recovered from the meningeal infection but died later of a brain abscess. This experience suggests that meningeal disease may so alter membrane permeability that terramycin, which cannot pass the normal blood-brain barrier, can enter the spinal fluid in these circumstances.



Terramycin serum levels during intravenous administration of 1 gm. every 12 hours (average of six patients).

High concentrations of terramycin have been found in fetal blood and in the pleural fluid.[10] In a case of tuberculous peritonitis with secondary ascites, a concentration of 5 γ per milliliter was obtained in the ascitic fluid. Detailed observations have already been published concerning the diffusion of aureomycin in tissue and body fluid.[11]

Dosage and Route of Administration.—In the early cases in this series aureomycin hydrochloride was administered by mouth in dosages of 0.5 gm. every six hours. When it became evident that a good response was not obtained with this dosage in cases of diffuse cellulitis without abscess formation until 72 or 96 hours had elapsed, the initial dose was increased to 3 gm. Such rapid therapeutic responses were then obtained that this dosage was used in all subsequent cases. Intravenous administration of aureomycin with sodium glycinate was necessary in only two cases. In the first, severe cellulitis of the leg with bacteremia, caused by a nonhemolytic Streptococcus, was accompanied by such severe vomiting that medication by mouth was not possible. Twelve hours after the administration of the intravenous dose (0.5 gm. in 250 cc. of 5% dextrose solution) a single dose of 2.5 gm. was given by the oral route and was retained. The second patient required intravenous therapy because of dysphagia caused by a large submandibular abscess. After three days of twice-daily medication by this route the infection subsided sufficiently to permit oral administration of the drug.

TABLE 1.—*Results in Forty-Seven Patients with Soft Tissue Infections Treated with Aureomycin*

Diagnosis	No. of Cases	Response		
		Good	Doubtful	None
Cellulitis	30	23	6 *	1 †
Cellulitis with early abscess	10	7	2 *	1 †
Furunculosis	3	2	1 ‡	0
Postpartum mastitis	4	3	1 §	0
Total	47	35	10	2

* Drug discontinued because of intolerance.
† Probably caused by inadequate dosage.
‡ Probably caused by low initial dose.
§ Possibly caused by interference with absorption by aluminum hydroxide.

The experience with aureomycin suggested a similar dosage for terramycin hydrochloride. It was therefore given in most cases in this series in an initial dose of 3 gm. followed by 0.5 gm. every six hours. In five cases in which the intravenous route was substituted for the oral route, 1 gm. was administered in 500 cc. of 5% dextrose solution; the infusion was run in as rapidly as was consistent with safety.

Untoward Reactions.—There were 9 instances of untoward reactions to aureomycin in the 47 patients treated with this drug. Two patients experienced such intractable vomiting that the drug had to be withdrawn; in both cases vomiting began after the initial administration of 3 gm. Another patient had urticaria of the face after the first dose. The reaction responded promptly to antihistaminic therapy, and there was no recurrence when aureomycin was continued. In the other six patients the reactions were not severe. Four patients experienced nausea, and two had frequent bulky stools. Our experience thus duplicates that of others and indicates that untoward

TABLE 2.—*Cellulitis (Forty-One Patients) Treated with Terramycin*

Diagnosis	No. of Patients	Days of Treatment	Results		
			Excellent	Good	Doubtful
Cellulitis					
Closed infection	18	5.8	6	12	..
Cellulitis without Abscess					
Hemolytic Staph. aureus	3	7	2	..	1
Hemolytic Streptococcus	3	7	2	1	..
Esch. coli	1	12	1	..	..
Cellulitis with Abscess					
Hemolytic Staph. aureus	8	7	2	6	..
Hemolytic Streptococcus	4	4.5	1	3	..
No culture obtained	4	4	2	2	..

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[10] Herrell, W. E.; Heilman, F. R.; Wellman, W. E., and Bartholomew, L. G.: Terramycin: Some Pharmacologic and Clinical Observations, Proc. Staff Meet., Mayo Clin. **25:** 183 (April 12) 1950.

[11] Herrell, W. E., and Heilman, F. R.: Aureomycin: Studies on Absorption, Diffusion and Excretion, Proc. Staff Meet., Mayo Clin. **24:** 157 (March 30) 1949.

reactions following the oral use of aureomycin are seldom severe enough to contraindicate its continued administration. It has been found that patients who do not tolerate the large initial dose can be given the drug intravenously, after which frequent smaller doses can be given by the oral route.

Terramycin is apparently free from serious toxic properties. In 153 patients there were 6 instances of nausea and vomiting, 10 of diarrhea, and 1 of proctitis; but all were mild. Several other patients complained of burning epigastric pain during the course of therapy. A few patients in the group treated for peritonitis had intractable nausea and vomiting after intravenous administration. In no case in either series were nephrotoxicity or hemopoietic disturbances noted, there being no deviations from the normal in the repeated urinalyses and blood cell counts carried out during treatment.

AUREOMYCIN

Results were satisfactory in 35 of the 47 infections in which aureomycin was used (Table 1), and the doubtful responses and failures were readily explained. In both failures, therapy had to be discontinued because of drug intolerance, as evidenced by uncontrolled nausea and vomiting. In the 10 instances of doubtful response, the 8 patients with cellulitis received doses that were probably insufficient, while the patient with furunculosis probably had an inadequate initial dose. The remaining patient in this group, who had postpartum mastitis, probably did not receive the full benefit of the aureomycin because, as has since been learned, the simultaneous administration of aluminum hydroxide interfered with its absorption.[12] Our general experience thus corresponds with the experience of others who have used aureomycin for similar infections.[4c]

TERRAMYCIN

Cellulitis.—There were no failures of treatment in the 41 cases of cellulitis treated with terramycin (Table 2), although 5 patients had infections of such severity that intravenous medication was required. The single patient whose response was doubtful had an infecting organism that was only slightly sensitive to terramycin in vitro. The response in 16 cases was classified as excellent in that dramatic clinical improvement was observed in 24 to 48 hours, as manifested by a fall in the temperature, a decrease in the leukocyte count, regression of the lesion, and improvement in general appearance of the patient. Twenty-four responses were classified as good, meaning that there was a gradual, steady clinical improvement over periods ranging from three to seven days. In 11 of the 16 cases with abscess, incision and drainage were employed, and in 2 others the abscess was aspirated and the cavity filled with terramycin. This means that in 13 of the 16 cases some surgical measure was combined with the antibiotic therapy. Beneficial effects of treatment, therefore, cannot be ascribed specifically to one form of therapy or the other. In many instances, however, terramycin appeared to hasten localization of the infectious process and to reduce the area of cellulitis surrounding the abscess, which suggests that most of the good results in this group can be attributed to the combined treatment.

Bacteremia.—Five of six patients with bacteremia (Table 3) had excellent results, as manifested by prompt clinical improvement, fall in temperature, and sterilization of the blood stream. All were treated by the intravenous route. One patient received aureomycin, and five patients received terramycin. In one case, that of a patient with 57% full-thickness burn and hemolytic streptococcic bacteremia, terramycin treatment was a complete failure. The organism was resistant to all the common antibiotics, and the patient died of an overwhelming septicemia. In one instance (Case 2) only a single dose of terramycin was administered intravenously. This is probably insufficient for a blood stream infection, as shown by the fact that it was 72 hours before the patient became afebrile. In the other patients treated with terramycin, intravenous medication was continued for two or three days, and resolution was correspondingly more rapid.

TABLE 3.—*Bacteremia Treated with Aureomycin and Terramycin*

Case No.	Infecting Organism	Primary Disease	Antibiotic Used	Days of Treatment	Results
1 *	*Nonhemolytic Streptococcus*	*Cellulitis of foot*	*Aureomycin*	*8*	*Excellent, afebrile in 72 hours*
2	Str. viridans	Cellulitis of leg	Terramycin	10	Excellent, afebrile in 72 hours
3	Hemolytic Staph. aureus	Unknown	Terramycin	15	Excellent, afebrile in 48 hours
4	Hemolytic Streptococcus	Osteomyelitis of tibia	Terramycin	6	Excellent, afebrile in 36 hours
5	Hemolytic Streptococcus	Full thickness burn	Terramycin	8	Failure, patient died of overwhelming septicemia
6	Hemolytic Streptococcus; Esch. coli	Infected gunshot wound of abdomen	Terramycin	9	Excellent, afebrile in 48 hours. Previous chloramphenicol, streptomycin, and penicillin therapy failed

* Also included in Table 1.

Miscellaneous Surgical Infections.—Four cases of gas gangrene of the leg were treated by emergency amputation and terramycin. The results were excellent in two patients, whose temperatures fell from 104 F to normal within 36 hours after amputation and institution of terramycin therapy. In the other two patients a less dramatic decline of the temperature was seen, but the response was good, as evidenced by the regression of symptoms in three days. Excellent results were obtained in three patients with anerobic clostridial cellulitis. As soon as the diagnosis was established the patients were given terramycin intravenously, and wide surgical excision of all devitalized tissue was done.

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12. Seed, J. C., and Wilson, C. E.: The Effect of Aluminum Hydroxide on Serum Aureomycin Concentrations After Simultaneous Oral Administration, Bull. Johns Hopkins Hosp. 86: 415 (June) 1950.

The two cases of actinomycosis are worth reporting in detail.

A 45-year-old white man with a history of intermittent swelling in the left parotid area for nine months was hospitalized because a recurrence five weeks before had persisted and, for the first time, was painful. Examination revealed a round, tender mass located at the lower anterior border of the left parotid gland and fixed to the skin. Aspiration produced 5 cc. of thick, greenish, purulent material. Culture was positive for Actinomyces bovis, which was sensitive to terramycin. The administration of penicillin procaine in 600,000 unit doses twice daily for eight days produced no improvement. Terramycin hydrochloride was then administered concurrently, in daily doses of 3 gm. At the end of three days of combined treatment the mass had decreased in size, and the dosage of terramycin hydrochloride was reduced to 2 gm. daily. Combined treatment was continued for a total of 14 days. At the end of this time only a very small, nontender nodule remained at the site of the original lesion. It was excised six weeks later, and there has been no recurrence in the nine-month period which has elapsed.

Table 4.—*Miscellaneous Surgical Infections (Fifty-One Patients) Treated with Terramycin*

No. of Patients	Diagnosis	Days of Treatment	Results: Excellent	Good	Doubtful	No Response
4 *	Gas gangrene of leg (Cl. welchii)	8	2	2	..	..
3 †	Anaerobic (Cl. welchii) cellulitis	8.1	3	..	..	..
2	Actinomycosis of jaw	14	2	..	..	..
	Infected traumatic wounds					
5	Hemolytic Staph. aureus	5.4	1	3	1	..
4	Hemolytic Streptococcus	5.4	2	2	..	..
2	Coli-aerogenes group	5.4	..	1	1	..
1	Pseudomonas	5.4	..	..	1	..
1	Klebsiella	5.4	..	1	..	..
3	*No culture obtained*	5.4	1	2	..	..
10	Infected burn granulations	11.3	..	..	..	10
3	Acute osteomyelitis	15	1	2	..	..
8	Furuncles and carbuncles	5	2	6	..	..
1	Human bite of hand	5	1	..	..	..
1	Dog bite of leg	4	1	..	..	..
1	Sting ray bite of foot	5	..	1	..	..
1	Acute parotitis (Hem. Streptococcus)	13	1	..	..	..
1	Breast abscess (Hem. Staphylococcus)	8	..	1	..	..

* Amputation in all four.
† Wide incision in all cases.

A 21-year-old man was hospitalized because of a painful swelling below the angle of the jaw, which had been present for six weeks prior to admission. He had received 300,000 units of penicillin procaine daily for seven days elsewhere, without evident results. Examination revealed a fluctuant mass, 5 by 5 cm., posterior and inferior to the angle of the right mandible. When it was incised, a large amount of purulent material exuded. This material yielded sulfur granules, but the culture was inadvertently misplaced before sensitivity tests could be obtained. Drainage ceased after five days of oral terramycin therapy, but treatment was continued for an additional nine days. The patient left the hospital with a well-healed wound.

Both of these cases illustrate an excellent response to terramycin after penicillin had been given without effect. Penicillin was continued in the first case, in which the results must be attributed to combined therapy, but not in the second, in which terramycin alone was responsible for the good results. The successful management of cervical actinomycosis with combined sulfonamide-penicillin therapy has been previously reported, and the first of the above cases suggests that a combination of terramycin and penicillin may be equally successful.

The results in 16 infected traumatic wounds were excellent in 4, good in 9, and doubtful in 3. One case was of particular interest because it demonstrated the necessity for adequate dosage of terramycin over a sufficient period of time. This patient had a traumatic ulcer surrounded by an area of cellulitis on the dorsum of the foot. Within 24 hours of the institution of treatment the temperature fell from 102.6 F to normal, and the surrounding erythema completely disappeared. By the end of the fifth day the ulcer was completely healed. Because diarrhea had occurred during therapy, the dosage was reduced from 0.5 gm. to 0.25 gm. every six hours. Three weeks later the cellulitis recurred. The same organism, a beta hemolytic Streptococcus, was again isolated. The infection responded within 48 hours to the administration of 0.5 gm. of terramycin hydrochloride every six hours. Treatment was continued for six days, and there were no further recurrences. The three cases showing doubtful response were infected gunshot wounds. In one patient the offending organism was a hemolytic Staphylococcus aureus, not sensitive to terramycin; in another Pseudomonas, and in the third, a coliform bacillus.

Ten patients with infected burn granulations received terramycin for an average of 11.3 days. In no instance did terramycin therapy influence the patient's course, the appearance of the granulation tissue, or its microbial flora. The infecting organisms were sensitive to terramycin in vitro in six cases and resistant in four, but the results were equally poor in all. The clinical picture remained unaltered irrespective of the degree of in vitro sensitivity.

Two of the three patients with acute osteomyelitis showed a good response and the other an excellent response to terramycin therapy. The last-mentioned patient had acute hematogenous osteomyelitis. In one of the other cases the osteomyelitis was secondary to a large subcutaneous abscess of the thigh, which was not evacuated for three weeks.

Results from terramycin therapy were excellent in two patients with furunculosis. A good response was obtained in four other patients with furuncles and two with carbuncles. In one patient, a large furuncle on the upper lip, which had not responded to 3,000,000 units of penicillin procaine, required surgical drainage. When the patient was first seen, the lesion was indurated. Localization was complete within 24 hours of the first dose of terramycin, and healing was uneventful after surgical drainage. The two patients with carbuncles received terramycin as an adjunct to surgical drainage and débridement.

In a patient with a human bite infection of the index finger, tenderness and edema disappeared within 72 hours. Acute pyogenic parotitis due to hemolytic Streptococcus that had not responded to penicillin and x-ray therapy subsided after 10 days of treatment with terramycin.

Peritonitis.—Fifty-six patients with acute secondary peritonitis following appendicitis, penetrating gunshot wounds of the abdomen, and other causes were treated with terramycin (Table 5). The diagnosis of spreading peritonitis was made in those patients with marked ileus, distention, diffuse abdominal tenderness, high fever, and toxemia. The temperature response, reappearance of peristalsis, and subjective sense of improvement of the patient were used as guides in the evaluation of therapy. Seventeen of the 27 patients with spreading peritonitis showed excellent results from terramycin treatment, as evidenced by a fall in temperature to normal in 48 to 96 hours and a return of peristalsis in 48 hours. In six patients good results were obtained after four to five days of therapy. There were four treatment failures. All were patients with peritonitis secondary to perforating gunshot wounds. In all instances cultures of peritoneal exudate showed organisms resistant to terramycin (staphylococci, nonhemolytic streptococci and/or coliform bacilli). After 48 to 72 hours of intravenous administration of terramycin with no change in the condition of the patient, another antibiotic to which the cultured bacteria were sensitive was given. Subsequently, all four patients progressed to an uneventful recovery.

Results in 13 patients with localizing peritonitis of appendical origin treated with surgery and terramycin were gratifying. Ten patients with localized peritonitis were treated with surgical drainage and terramycin. The exact role of the antibiotic as an adjunct to surgery is difficult to evaluate. Acute exacerbation of pelvic inflammatory disease was promptly controlled by terramycin in six patients, but no significant changes in the size of the pelvic masses were detectable. This experience with human peritonitis confirms our previous data[13] in experimental peritonitis and shows the therapeutic efficacy of this antibiotic in peritoneal infections.

COMMENT

The multiplicity of factors involved in the uneventful resolution of a surgical infectious process makes it difficult to evaluate the role played by whatever antibiotic may be used in treatment. Moreover, the small number of patients in this series makes it impossible to draw any statistically significant conclusions. On the other hand, certain definite clinical impressions seem justified. Aureomycin and terramycin are clearly useful agents in surgical infections. They are superior to penicillin in at least two respects: their wider antimicrobial spectra and their convenient administration by the oral route without loss of effectiveness and without serious untoward reactions. Furthermore, allergy and drug-fastness are as yet minor problems with them.

However, experience with penicillin in pyogenic surgical infections on a large scale has been so satisfactory that penicillin will not easily be displaced as the drug of choice in these infections. Terramycin and aureomycin must be studied much more intensively before any final judgment is passed on their role in the surgeon's therapeutic armamentarium. For the present, it can be said that they are undoubtedly useful alternates in the antibiotic treatment of soft tissue infections. The practitioner who does not have ready access to laboratory facilities, when confronted with an acute pyogenic infection that fails to respond to penicillin in 24 to 48 hours, can safely use either terramycin or aureomycin with an 85 to 90% assurance that treatment will be effective.

Mixed infections offer the most promising field of usefulness for the newer antibiotics. Combined therapy with penicillin and streptomycin has already achieved excellent results in mixed gram-positive coccic and gram-negative bacillary infections.[14] If a single orally-administered drug can replace two drugs that must be administered by the parenteral route, the advantage is self evident. Both aureomycin and terramycin have been shown to give very promising results in the treatment of peritonitis.[15]

In many of the patients in this series good results were achieved by a combination of antibiotic treatment and surgical drainage. In all probability, good results could have been obtained in some of these patients by immobilization and surgery alone, but adjuvant specific therapy is thought to have expedited cure. Other cases show that antibiotic therapy has not eliminated the necessity for surgical drainage of well-formed abscesses.

Terramycin and aureomycin are similar in their antimicrobial spectra, dosage, route of administration, and seemingly, in the mechanism of their antibacterial action. Both are bacteriostatic rather than bactericidal. Herein lies their inferiority to penicillin, which, if given in very high dosages, is predominantly bactericidal. Consequently, in diseases such as endocarditis, in which a cure depends on the actual destruction of bacteria, results of treatment with aureomycin have not been encouraging.[14a] Similarly, a high recurrence rate has been observed in brucellosis, unless an adequate dosage has been given for a prolonged period of time. These experiences, translated to surgical infections, suggest the need for sufficiently high dosages and for therapy of proper duration.

TABLE 5.—*Peritonitis Treated with Terramycin* *

		Response			
Type	Total Cases	Excellent	Good	Poor	Doubtful
Spreading peritonitis †	27	17	6	4 ‡	..
Localizing peritonitis	13	6	7	..	..
Localized peritonitis	10	1	3	2	4
Pelvic inflammatory disease	6	..	6	..	..
Total	56	24	22	6	4

* Dose: 1 gm. intravenously twice daily for 3 to 4 days, then 2 gm. orally for 10 days.

† Appendicitis, 6; gunshot wound, 14; perforated viscus, 3; knife, bowel resection, intestinal strangulation, unknown, 1 each.

‡ Gunshot wound.

SUMMARY

A report is made on 47 patients with surgical infections treated with aureomycin and 153 patients treated with terramycin. Of the 47 aureomycin-treated patients, results were unsatisfactory in only 12, the reasons for the poor response being evident. The results in the remaining 35 patients were satisfactory. All but one of the 41 patients with cellulitis treated with terramycin exhibited gratifying results. An excellent response was evident in four of the five cases of terramycin-treated bacteremia. Satisfactory results were obtained in almost all of the group of 51 miscellaneous surgical infections. Ten patients with extensive infected burns failed to respond.

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[13] Pulaski, E. J.; Shaeffer, J. R.; Artz, C. P., and Baker, H. J.: Studies on the Use of Terramycin in Experimental and Clinical Peritonitis, in Surgical Forum: 1950 Clinical Congress of the American College of Surgeons, Philadelphia, W. B. Saunders Company, 1951, pp. 119-128.

[14] (*a*) Herrell, W. E., in discussion of Symposium on Antibiotics before the Joint Meeting of the Section on Internal Medicine and the Section on Experimental Medicine and Therapeutics at the Ninety-Ninth Annual Session of the American Medical Association, San Francisco, June 30, 1950, J. A. M. A. **144**: 533 (Oct. 14) 1950. (*b*) Jawetz, E.; Gunnison, J. B., and Coleman, V. R.: The Combined Action of Penicillin with Streptomycin or Chloromycetin on Enterococci in vitro, Science **111**: 254 (March 10) 1950. (*c*) Pulaski, E. J., and Baker, H. J.: Combined Therapy of Infectious Disease, South. M. J. **42**: 765 (Sept.) 1949.

[15] (*a*) Pulaski and associates.[13] (*b*) Wright, L. T., and Prigot, A.: Aureomycin as an Aid in Abdominal Surgery, Ann. Surg. **133**: 364 (March) 1951.

The excellent results recorded in 52 of 56 patients with peritonitis suggest the value of terramycin in this type of infection. The four treatment failures in this group are attributed to the fact that organisms resistant in vitro to terramycin were present.

COORDINATED APPROACH TO ANTABUSE® THERAPY

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So disappointing have been the drugs and methods used in the approach to the problem of alcoholism that one must exert great caution in evaluating any new technique. However, recently many enthusiastic reports have entered the literature concerning the drug known as tetraethylthiuramdisulfide, or, as it is more commonly called, antabuse.®[1]

From the historical background, it has been noted previously that workers exposed to tetraethylthiuramdisulfide in the rubber industry had discovered their tolerance for alcohol considerably decreased. Hald and Jacobsen[2] employed tetraethylthiuramdisulfide as a possible anthelmintic and found that there were no toxic effects over an extended period of time. They also observed that contact with alcohol produced a moderately severe disagreeable physical reaction, consisting of headache, flushing, palpitation, nausea, and vomiting. The physical effects were explained on the basis of the drug's interference with the metabolism of alcohol at the acetaldehyde stage, allowing acetaldehyde to accumulate. Voegtlin's[3] studies with the conditioned reflex emetine aversion method indirectly suggested the possibility of using tetraethylthiuramdisulfide as a pure aversion technique. Martensen-Larsen[4] described the clinical results in 1948, indicating its favorable effect.

Our purpose in presenting this paper is to report the studies and results on a series of 32 chronic addictive drinkers over a period of eight months at the Blue Hills Clinic,[5] Hartford, Conn. Our previous study[6] has dealt with the preliminary psychiatric implications of tetraethylthiuramdisulfide. This paper intends to incorporate some of these findings and to correlate them with the over-all medical and physiological implications.

SELECTION OF PATIENTS

Because of the severe physical reactions that can occur during the tetraethylthiuramdisulfide-alcohol reaction, it has been our belief that only hospitalized patients should be started on the drug. Patients are selected after a thorough screening process, which consists of three parts: (1) complete physical examination, (2) neuropsychiatric survey, and (3) laboratory studies.

The Danish workers have stressed certain physical conditions that preclude the administration of tetraethylthiuramdisulfide. These investigators[7] have felt that the presence of severe degrees of myocardial disease or failure, hypertension, diabetes mellitus, hypothyroidism, hyperthyroidism, epilepsy, nephritis, cirrhosis of the liver, pregnancy, and paraldehyde addiction were definite contraindications. The outstanding physical phenomenon in the tetraethylthiuramdisulfide-alcohol reaction is most commonly a circulatory one, and in the evaluation of a patient from a physical point of view, a sound cardiac status is desirable. The cardiac examination of the patient is thus detailed and includes the resting electrocardiogram and a Two-Step Master Test.[8] Hypertension of moderate degree without cardiac abnormalities and diabetes mellitus have not presented absolute contraindications in our experience. In addition, the presence of a cirrhotic process in the liver has not presented an absolute barrier to the introduction of tetraethylthiuramdisulfide. The degree of liver dysfunction as demonstrated by laboratory testing must be evaluated in an absolute sense and in the light of future damage caused by continued alcoholic excess.

The potential effects of tetraethylthiuramdisulfide should be carefully evaluated from the psychiatric viewpoint. Reports of personality disorganization have been observed by many investigators.[9] Thus, the understanding of the psychodynamics in the patient receiving the drug is important. We believe that tetraethylthiuramdisulfide in its representation of help may act in two different directions: first, it may reinforce the existing

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Drs. Leon Greenberg and David Lester assisted in the laboratory and physiological studies, and technical aid was given by Mr. Morris Freidman.

Associate Physicians, Internal Medicine (Drs. Mann and Conway); Physician-in-Charge, Outpatient Service (Dr. Gottesfeld); and Physician-in-Charge, Inpatient Service (Dr. Lasser); Blue Hills Clinic.

[1] *Antabuse® was supplied for research purposes by Ayerst, McKenna and Harrison, Ltd., New York.*

[2] Hald, J., and Jacobsen, E.: A Drug *Sensitizing* the *Organism to Ethyl Alcohol, Lancet* **2**: *1001-1004* (Dec. 25) 1948.

[3] Voegtlin, W. L., and Broz, W. R.: The Conditioned Reflex Treatment of Chronic Alcoholism; Analysis of 3,125 Admissions Over a Period of 10½ Years, Ann. Int. Med. **30**: 580-597 (March) 1949.

[4] Martensen-Larsen, O.: Treatment of Alcoholism with a Sensitizing Drug, Lancet **2**: 1004-1005 (Dec. 25) 1948.

[5] The clinic is operated by the State of Connecticut under the Commission on Alcoholism and has been in operation since April, 1950. It is composed of both an outpatient department and an inpatient department, the latter having 50 beds.

[6] Gottesfeld, B. H.; Lasser, L. M.; Conway, E. J., and Mann, N. M.: Psychiatric Implications of the Treatment of Alcoholism with Tetraethylthiuram Disulfide; Preliminary Report, Quart. J. Stud. Alcohol **12**: 184-205 (June) 1951.

[7] Glud, E.: The Treatment of Alcoholic Patients in Denmark with "Antabuse," with Suggestions for Its Trial in the United States, Quart. J. Stud. Alcohol **10**: 185-197 (Sept.) 1949.

[8] Master, A. M.; Friedman, R., and Dack, S.: The Electrocardiogram After Standard Exercise as a Functional Test of the Heart, Am. Heart J. **24**: 777-793 (Dec.) 1942.

[9] (*a*) Gottesfeld, Lasser, Conway, and Mann.[6] (*b*) Bennett, A. E.; McKeever, L. G., and Turk, R. E.: Psychotic Reactions During Tetraethylthiuramdisulfide (Antabuse) Therapy, J. A. M. A. **145**: 483-484 (Feb. 17) 1951. (*c*) Bowman, K. M., and others: A Clinical Evaluation of Tetraethylthiuramdisulfide (Antabuse) in the Treatment of Problem Drinkers, Am. J. Psychiat. **107**: 832-838 (May) 1951

therapeutic relationship to the individual physician, psychotherapist, group, or hospital; second, it may unconsciously represent a type of threat which being equated with psychotherapy and its implications may arouse such ambivalence that therapy is terminated.

Examination of the life history pattern will give important indications of the anticipated reaction to therapy and tetraethylthiuramdisulfide. Persons who have had the most traumatic experiences in childhood with parental figures will, as a rule, find it increasingly difficult to adjust to therapeutic figures who act as parental substitutes. The ability of the patient to accept and respond to help is not necessarily based on conscious mechanisms; thus many who have initially appeared eager for a solution to their problems have been prominent failures.

To such threatened persons, tetraethylthiuramdisulfide and the implications of sobriety and therapy can represent a stress that forces them to utilize a "last ditch" defense measure, the psychotic or near-psychotic reaction. In our experience, those who have become disorganized have been borderline schizophrenic and schizoid persons. The overt schizophrenic has not been considered for tetraethylthiuramdisulfide therapy. Under intense stress some of the patients in the former group are known to have shown transient but marked personality disturbances in their past lives.

It is important to recognize, nevertheless, that all borderline schizophrenics will not become disorganized during the course of therapy. The crucial factors responsible for the ability to remain intact appear in most instances to be the absence of highly organized projective and sadomasochistic difficulties along with the ability to maintain some control over hostile, aggressive impulses. In the last analysis the adjustment to therapy and tetraethylthiuramdisulfide depends on the dynamic adjustment of the patient, his present interpersonal and object relationships, and his past and present reactions to help and to stress. It is possible that toxic factors may contribute to the disorganization, but the expression of the breakdown appears to depend on dynamic considerations.

The laboratory examinations required include (1) complete blood cell count, (2) urinalysis (with renal function tests where indicated), (3) Wassermann test, (4) nonprotein nitrogen determination, (5) fasting blood sugar test, (6) cephalin flocculation, (7) sulfobromophthalein sodium test, and (8) electrocardiogram. Further studies, such as chest x-ray, electroencephalogram, and basal metabolism test, are done where indicated.

ROUTINE

Tetraethylthiuramdisulfide is not administered at the clinic to patients under the effects of a recent alcoholic debauch. This is felt to be a dangerous practice, inasmuch as the subject under observation is an unknown with respect to tetraethylthiuramdisulfide reactivity. Individuals vary in their reactions to the combination of tetraethylthiuramdisulfide and alcohol. Thus, it would be unwise to administer tetraethylthiuramdisulfide to one whose blood alcohol level was already elevated in the absence of a previous controlled test.

We have been accustomed in our earlier cases to using the tetraethylthiuramdisulfide dosage routine suggested by Glud.[7] This has consisted essentially of the administration of 2 gm. on the first day, 1.5 gm. on the second day, 1 gm. on the third day, and 0.75 gm. on the fourth day. On the last day, the test reaction with alcohol is given. The dose of actual alcohol employed is usually 10 to 14 cc. in the form chosen by the patient. The subject is carefully supervised throughout the entire reaction by a staff that includes physicians, nurse, and attendant. A tetraethylthiuramdisulfide emergency truck, containing oxygen, cardiac and respiratory stimulants, intravenous ferrous ascorbate and vitamin C, and intravenous fluids, is kept constantly on hand for any untoward situation. After the initial reaction, the dosage is decreased to a maintenance dose varying from 0.25 to 0.75 gm. each day and subsequent reactions are held periodically for reinforcement purposes.

Recently, we have begun to calculate dosage of tetraethylthiuramdisulfide on the basis of body weight. It has been apparent for some time that some attempt should be made to calculate dosage with relation to the weight of the individual patient. Therefore, studies were made, and are still in progress, whereby an initial daily priming dose of 20 mg. per kilogram of body weight is employed. This project is under investigation in order to establish a more consistent approach to the subject of dosage. Emotional factors, constitution, and toxicity may play a definite role, but this has not been completely evaluated.

TABLE 1.—*Psychiatric Classification of Patients*

Neurotic Character Disorder, Case No.			Borderline Schizophrenia, Case No.			Paranoid Condition, Case No.	
1*	3	4*	2	7	9	12	17
5*	6	8*	10	14	18		
11	13	15	22	23	24		
16	19*	20					
21*	25	26					
27*	28*	29					
30*	31*	32*					

* With schizoid trends.

The following material deals with detailed studies carried out thus far on 32 addictive alcoholics. From a purely somatic point of view, it may be noted that four of these patients had moderate hypertension. One of the patients had accompanying cardiac enlargement with a normal resting electrocardiogram but a positive Two-step Master Test. This patient, however, had no clinical angina or history of decompensation. Tetraethylthiuramdisulfide was given with recognition of the risk to a patient whose course with her alcoholic history would otherwise have been precarious. One patient exhibited mild diabetes mellitus regulated by diet. Another patient exhibited an enlarged liver, although hepatic function tests were not adversely affected.

The psychiatric evaluation of the above series of cases is presented in Table 1. The survey of a potential tetraethylthiuramdisulfide candidate makes use of a battery of psychological tests, including the Rorschach. The services of the social service [illegible] are considered invaluable in estimating the [illegible] adaptati[illegible] his family and c[illegible] to e[illegible] his life-long mode [illegible]

It will be [illegible] by far number of [illegible] phasized that the evaluation as given above represents our conception of the patients prior to the institution of the tetraethylthiuramdisulfide regimen. This proved to be correct in our subsequent experience except in one case (Case 26), where the extreme degree of defensive orientation served to mask the underlying schizoid mechanisms.

TETRAETHYLTHIURAMDISULFIDE-ALCOHOL REACTION

The effects of the tetraethylthiuramdisulfide-alcohol reaction have been described as formidable. These consist of manifestations primarily of a circulatory type, although respiratory and gastrointestinal signs are also prominent. Flushing of the skin, cyanosis, dyspnea, vomiting, tachycardia, and occasional severe falls in blood pressure are features that are all common and have been emphasized previously. In the group under study the erythema described as so outstanding in other writings was seen in all patients; 18% experienced dyspnea; 75% complained of nausea; 63% had vomiting; 12% reported abdominal cramps; and 85% passed into a deep slumber after their reactions.

TABLE 2.—*Side-Effects* to Tetraethylthiuramdisulfide*

Case No.	Drowsiness	Nausea	Abdominal Cramps	Sexual Drive	Hives	Psychotic Reactions
1	+	0	0	↓	0	0
2	0	0	0	↑	0	0
3	+	+	0	↑	0	0
4	+	0	0	↓	0	+
5	+	0	0	—	0	0
6	+	0	+	↑	0	+
7	+	0	+	↑	0	+
8	+	0	0	↑	0	0
9	+	0	+	↑	0	+
10	0	0	0	—	0	0
11	+	0	0	↑	0	0
12	+	0	+	↓	0	+
13	+	0	0	—	0	0
14	+	0	+	—	0	0
15	+	0	0	—	0	0
16	+	0	+	↑	0	0
17	+	0	0	—	0	0
18	+	0	0	↓	0	+
19	+	0	0	↓	0	0
20	+	0	0	—	0	0
21	+	+	0	↑	+	0
22	+	0	+	—	0	0
23	0	0	0	↑	0	0
24	+	+	+	—	0	0
25	—	0	+	—	0	0
26	0	0	0	—	0	+
27	+	0	0	—	0	0
28	+	0	+	—	0	0
29	+	0	0	↑	0	0
30	+	+	+	—	0	+
31	+	0	+	—	0	0
32	+	0	+	—	0	0

* Present +; absent 0; no change —; increased ↑; decreased ↓.

Marked disturbances of blood pressure, pulse and respiratory rate recordings were evident. Seen rather early was a marked increase in pulse rate, accompanied later by a moderate drop in systolic pressure and an even severer decrease in diastolic pressure. The respiratory excursions were frequently increased in rate and at times became labored.

In several cases the vasomotor responses were so severe that falls of 40 to 50 mm. in the systolic pressure were noted; levels in the diastolic pressure of 20 to 40 mm. not infrequently accompanied this phenomenon. Despite these striking features, the patient's condition in most instances was not alarming. Under careful observation, the unusual changes were seen to regress as the reaction waned in its intensity. In one case (23), however, the ensuing reaction proved so severe, that emergency aid was found necessary. This patient had not exhibited a satisfactory reaction on his first test with standard doses of alcohol. Because of the patient's particularly flat emotional response to the test and inasmuch as a good reaction was desirable from a therapeutic standpoint, a larger amount of alcohol was ordered for the second test—55 cc. of whiskey was given. The patient subsequently became very ill, exhibiting marked cyanosis, cardiac extrasystoles, and eventual shock. Oxygen, elevation of the foot of the bed, and cardiac stimulants were administered, with eventual satisfactory results. While ferrous ascorbate and vitamin C used intravenously have been reported as satisfactory antidotes for this type of reaction, our use of this medication in alarming situations and also in preliminary controlled tests has not resulted in the success claimed by others.[10] These experimental tests are continuing. The most reliable and effective aids to date in the extremely severe reaction have been oxygen administered by nasal catheter, the occasional administration of intravenous fluids, such as 5% dextrose in isotonic sodium chloride solution, use of the Trendelenberg position where necessary, and the occasional administration of such stimulants as caffeine sodium benzoate and epinephrine.

Painstaking cardiac examination prior to the acceptance of a patient for tetraethylthiuramdisulfide therapy has been stressed previously, but periodic checks of the cardiac mechanism during the actual reactions is also important. It has been our custom usually to test each patient electrocardiographically at the height of the reaction. Of 24 patients tested in the present group, all exhibited an increased rate but no significant disturbance of rhythm. Fifty-four per cent revealed depression of the S-T segments in various leads, and 92% showed T wave changes varying from lowering of amplitude to actual inversion. These alterations are usually quickly reversible. However, the danger of an acute irreversible cardiac insult is to be kept in mind, particularly when dealing with members in the older age groups.

SIDE-REACTIONS TO TETRAETHYLTHIURAMDISULFIDE

While initially the lack of any side reactions to tetraethylthiuramdisulfide taken over a long period of time was stressed, definite side-effects have since been noted. Prominent among these have been drowsiness, nausea, abdominal cramps, and diminished sexual drive. These have been listed in Table 2. It will be noted that almost 90% of the group complained of drowsiness. This, at times, became rather annoying to the patient, especially during his working hours. Patients awaiting their therapeutic interviews would on occasion be found sleeping in the reception room. This effect in many cases proved beneficial, as it was accompanied by loss of anxiety and tension. In most subjects, the sedative action was transient, lasting only two to five weeks after institution of therapy.

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[10] Jokivartio, E.: Effect of Iron Preparations on "Antabuse"-Alcohol Toxicosis, Quart. J. Stud. Alcohol 11: 183-189 (June) 1950.

Occasionally, nausea and abdominal cramping pains persisted for many days after the tetraethylthiuramdisulfide-alcohol reactions. In four subjects, nausea continued to be a disturbing factor for a period of approximately one month. Abdominal discomfort was a more prominent side-effect; 40% of the series complained for a period of three to four weeks after discharge. In many instances, it was necessary to lower the maintenance dose for a short period and institute therapy of an antacid and antispasmodic nature.

In half of the series, some alteration of sexual drive was observed in the early phase following discharge from the clinic and during outpatient care. Thirty-four per cent revealed increased sexual vigor and drive, although all except one patient (Case 12) indicated difficulty in achieving orgasm. Sixteen per cent reported a decrease in sexual drive and potentia.

A manifestation of this nature is very disturbing to the patient. Sexual prowess in the male in our society is considered a criterion of masculine function. As such, it is an important factor to consider, especially in dealing with disturbed persons. This was a trying element in the therapeutic interviews. Fortunately, the effect was transient in most cases. Much discussion has centered about the possibility that this effect is physiological in origin. We feel that physiological factors should be considered as only a part of the total picture and that these sexual disturbances are a result of a combination of the tremendous stress the patient is being subjected to from the dynamic point of view and possible toxic effects of tetraethylthiuramdisulfide.

Urticaria of a severe nature was seen in one case (Case 21) in our series. This has been reported previously.[11] This patient had been receiving the drug for approximately five weeks when he suddenly evidenced a giant hive-like eruption associated with arthralgia, fever, and pruritus. There was no previous allergic history noted. No other drugs were being taken at the time. It should be noted that the patient was acutely disturbed for several weeks prior to the episode, and it is likely that this had some bearing on the total picture. Use of the drug was discontinued, and antihistaminics and epinephrine were given immediately, with success. Later, small amounts of the drug were again instituted, with the idea of gradually building up the dose once more. Antihistaminics were continued. There was a recurrence of the allergic manifestations. Unfortunately, the patient could not endure the difficulties he was undergoing and discontinued his association with the hospital. He then resumed drinking, but no severe reaction occurred, probably owing to the insufficient dosage of tetraethylthiuramdisulfide.

One of the most important effects associated with the administration of tetraethylthiuramdisulfide is the psychotic reaction. As more and more of the drug is being given, these reactions have become prominent. In our present series, psychotic reactions were observed in eight cases. In three of these (Cases 4, 6, and 12) they were of a relatively mild nature, occurring after hospital discharge, and were controlled with careful psychotherapy and sedation. Tetraethylthiuramdisulfide was continued safely. It is interesting to note that Cases 4 and 6 were classified originally in the neurotic group. In Case 4 some schizoid trends were exhibited. The condition in Case 12 was classified as paranoid. In the remaining five cases, 7, 9, 18, 26, and 30, rather severe reactions ensued shortly after the start of therapy. In Case 7 there was evidence of disorganization four weeks after institution of tetraethylthiuramdisulfide therapy while the patient was still in the hospital. The reaction was so alarming that discontinuance of tetraethylthiuramdisulfide and subsequent removal of the patient to a mental institution was necessary. After 24 hours, she returned to normal. The patient was felt to be a borderline schizophrenic, for whom the therapeutic relationship was too difficult and threatening to handle and who periodically required alcohol to express her instinctual drives.

One patient (Case 9) had been discharged from the hospital for three weeks and had been interviewed weekly in the outpatient department. He subsequently had an acute anxiety attack and was taken to the hospital, where physical examination disclosed no abnormalities other than marked tension and apprehension. The patient was observed to be hallucinating and revealed other evidence of disorganization. It was felt that, because of the severity of the reaction, the drug should be discontinued. Complete recovery occurred in 24 hours. Here again was a borderline schizophrenic whose tremendous need for alcohol in meeting his inner needs was threatened by tetraethylthiuramdisulfide therapy, resulting in breakdown.

Another patient (Case 18) had been discharged from the hospital for two months and had been undergoing intensive therapy in the outpatient department. Disorganization occurred and was impossible to control. Removal to the hospital with discontinuance of the drug was accomplished with prompt recovery of the patient. The patient had originally been given a diagnosis of borderline schizophrenia. The threatening effect of the drug in preventing the release of psychotic needs in alcoholic episodes is again clearly shown here.

Case 26 represents an instance in which further study prior to the institution of tetraethylthiuramdisulfide therapy might possibly have prevented what later occurred. The patient was thought to fit into the neurotic group. He was considered after the usual tests to be a satisfactory candidate and made some response to psychotherapy. The administration of tetraethylthiuramdisulfide, however, resulted in partial disorganization. The trial reactions were not wholly satisfactory, and before their completion the patient broke down, developed frank paranoid feelings, became extremely detached and affectively flattened, and exhibited incapacitating ambivalence toward help. He attempted to play one therapist against another and eventually departed precipitously from the hospital. This patient thereupon became acutely intoxicated, and a moderate tetraethylthiuramdisulfide-alchol reaction developed, which was treated in a hospital in another city. The emotional response prior to his leaving the hospital represented a schizophrenic reaction pattern, but follow-up studies regarding the outcome have been incomplete.

A patient (Case 30) who had been hospitalized for a lengthy period of time and had undergone extensive therapy expressed some resistance toward breaking up his relationship with the inpatient therapist and beginning a new one in the outpatient department. Two weeks later this patient began to become disorganized and discontinued the drug voluntarily. He was subsequently readmitted to our hospital and became worse under observation, necessitating transfer to a state hospital, where he recovered rapidly. It is to be noted that removal of the drug did not affect the situation immediately as it had in other cases. Because of the existence of slight brain damage, noted previously on neurological examination and on the electroencephalogram, and because of the lack of rapid recovery on cessation of the drug, it was believed that organic factors may have complicated the picture. This complication has been noted elsewhere and tetraethylthiuramdisulfide's possible detrimental effect, through anoxia, on already damaged tissues considered.[9b] After the patient had recovered completely and was discharged, he again began drinking. He is at present hospitalized for further investigation.

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[11] Lewis, H. M., and Bremers, H. H.: Fixed Drug Eruption from Tetraethylthiuram Disulfide (Antabuse), J. A. M. A. **142**: 1141 (April 15) 1950.

ADDITIONAL RESULTS

Discontinuance of the drug in several other cases for different reasons has occurred.

Case 2.—The drug was discontinued after several weeks, while the patient was still in the hospital, because the referring agency would not undertake the responsibility for the continuation of treatment.

Case 6.—After four months of sobriety and continuous therapy, the patient suddenly discontinued the drug, became anxious and fearful, and proceeded to drink. Immediate hospitalization and resumption of therapy was successfully instituted.

Case 8.—After one month, the patient discontinued the drug voluntarily and, after a short period, became intoxicated. Thereafter, he reached sobriety and again resumed the program for two months. Since that time the clinic has not heard from him.

Case 10.—The patient continued to take the drug and maintained contact with the clinic for five months. Complete sobriety was achieved. However, she then discontinued contact but has remained sober to this date.

Case 11.—Control was well maintained with tetraethylthiuramdisulfide for approximately three months; thereupon the patient broke contact and began drinking. Later, he returned to the clinic, contrite, asking for the drug once more. At this time he is again receiving tetraethylthiuramdisulfide and being seen regularly.

Case 13.—The patient did not continue her contacts with the clinic regularly after discharge from the hospital. Five weeks of sobriety ensued, whereupon she suddenly discontinued the drug and proceeded to become intoxicated. Her contacts with the clinic were then discontinued.

Case 15.—The patient maintained clinic contact for one month subsequent to hospital discharge. No more was heard from the patient thereafter.

Case 19.—After four months of sobriety and regular outpatient attendance, the patient indicated negligence and forgetfulness in taking tetraethylthiuramdisulfide for two weeks and proceeded to become intoxicated. This episode was short-lived (one day), and he quickly resumed taking the drug under supervision. The apparent resistance to the tetraethylthiuramdisulfide program and the resistance of the patient in therapy are of interest and are seen repeatedly. Three weeks later the patient was stricken with a massive hematemesis. Prompt hospitalization with transfusion was quickly effected. Subsequent investigation failed to disclose any source for the bleeding, although the gastrointestinal tract was carefully studied. Tetraethylthiuramdisulfide was temporarily discontinued. There was a history of "nervous stomach" and frequent indigestion prior to treatment; and it is likely that a small peptic ulceration was the origin of the hemorrhage. We cannot ascribe the cause at this point to the tetraethylthiuramdisulfide therapy on an organic basis, although this matter is under investigation. It should be added, however, that at the time of the hemorrhage the patient was under intense emotional stress and was threatened by an impending change of therapists.

Case 20.—The patient maintained excellent contact and sobriety for five months and then discontinued her appointments. One month later, she called while acutely intoxicated, begging for help. She related a story of overconfidence and resentment at the necessity for taking such medication as tetraethylthiuramdisulfide. This led to discontinuance of the medication and several weeks later, a drinking episode. The patient was hospitalized again, given tetraethylthiuramdisulfide and resumed her contacts with therapy.

Case 21.—This patient has been referred to previously as the one in whom giant hives occurred. He departed from the hospital against advice and subsequently resumed drinking.

Case 24.—The patient evidenced sobriety for two months, when she suddenly discontinued the drug and became intoxicated. She was jailed for a short period and then voluntarily resumed therapy and the drug. Again, three months after the above episode, termination of her clinic contacts occurred. She indulged in a drink while taking the drug; a moderate reaction developed, necessitating hospitalization at another institution in the city. The family physician who saw her was cognizant of what had occurred and wisely referred her for care. Since that time the patient has again resumed therapy.

Case 25.—The drug was discontinued three weeks after the patient's discharge because of a diagnosis of a bleeding peptic ulcer. A suggestive history of gastritis had been present prior to the institution of tetraethylthiuramdisulfide therapy. Again no direct etiologic connection was assumed between the episode and tetraethylthiuramdisulfide.

Case 27.—The patient remained sober for two months. Thereupon he returned to the clinic for a reinforcement reaction with alcohol. Profound shock, chest pain, and cyanosis occurred. Fortunately, the patient recovered satisfactorily, but he was so disturbed by his "narrow escape" that he voluntarily discontinued his tetraethylthiuramdisulfide and clinic contacts.

Case 28.—This patient did rather well for two months and then voluntarily stopped the drug. After one week he became intoxicated. Relations with the clinic and continuance of the drug were begun once more. However, after one month the drug and clinic contacts were completely suspended.

Case 29.—The patient remained sober for five months and then voluntarily discontinued the drug. Ten days later, he began to drink. The next morning, however, fearful and anxious, he called the therapist, obviously desiring reassurance and acceptance. This was forthwith given, and he resumed therapy and the drug.

Case 31.—This patient remained sober five weeks and then discontinued the drug. One month later, the patient again resumed the program. This was followed by three separate episodes of drinking; later he resumed therapy.

Thus, of 32 patients, 10 (31%) have maintained complete sobriety to date and continue with tetraethylthiuramdisulfide therapy. One (3%) remains sober but has discontinued tetraethylthiuramdisulfide and therapy. In five (16%) psychotic reactions developed that were sufficiently severe to cause permanent discontinuance of the drug. In one case (3%) tetraethylthiuramdisulfide therapy was discontinued because of administrative reasons. Two cases (6%) involved gastrointestinal disorders which necessitated cessation of tetraethylthiuramdisulfide. Seven patients (22%) voluntarily discontinued the drug permanently. Six (19%) discontinued the drug voluntarily for a short period of time and eventually resumed therapy. Sixteen (50%) thus remain on the tetraethylthiuramdisulfide regimen and are being followed.

IMPROMPTU REACTIONS

The danger of a tetraethylthiuramdisulfide-alcohol reaction precipitated by the patient himself must be emphasized. Two such instances have occurred in our series. The first incident (Case 26) occurred in another city. The attending physicians became cognizant of the reaction by noting the antabuse® card, which all patients carry. The second incident has already been referred to in Case 24. The purpose of these cards is similar to that with respect to the diabetic patient, who carries a card stating his medical condition. The information on the card indicates the type of drug being taken and the character of the reaction that may ensue on contact with alcohol. The name of the patient's physician is also stated.

The importance of the above precaution is obvious. It is inevitable that some patients will drink while still taking the drug, even though more efficient screening efforts, based on past experiences, may minimize this in the future. The ensuing episode may vary in intensity, depending on the total exposure, emotional implications, and the reactivity of the patient. Since the picture may simulate acute alcoholic intoxication, those confronted with the problem for the first time may not be aware of the true situation and the necessary steps to be taken. In the present series, most patients who discontinued the drug and became intoxicated did so with the apparent recognition that no reaction would result after two to three weeks' cessation of tetraethylthiuramdisulfide therapy.

Several tetraethylthiuramdisulfide-alcohol reactions have occurred under unusual circumstances. Patients have been cautioned to avoid exposure to alcohol, whether it be in the form of drink or fumes. Cough medicines, rubbing alcohol, and exotic foods containing alcoholic products have been stressed as dangerous agents. Nevertheless, one patient who had been taking tetraethylthiuramdisulfide for several months (Case 23) suddenly had a generalized convulsion, lasting several minutes. Hospitalization was immediately effected. The patient was seen one-half hour later, at which time he appeared somewhat pale and tremulous. The history revealed the following facts. The patient managed a tavern and had been working all day, when he suddenly slumped to the floor and exhibited generalized convulsive movements. There was no biting of the tongue or passage of urine. The seizure stopped spontaneously in two to three minutes. There was no previous history of such episodes. The patient had been taking no other drugs while taking tetraethylthiuramdisulfide. He had been seen regularly at the clinic and had been doing well. Examination, including a careful neurological survey, disclosed no striking features. The electrocardiogram was normal as was the electroencephalogram. Results of blood studies were also normal. Further history revealed that this patient had engaged for many hours in the cleansing of beer and alcohol glasses in a warm room in his tavern. When the lack of sufficient ventilation was brought out by questioning, the explanation became clear. The exposure to what must have been a heavy concentration of alcoholic fumes apparently resulted in an unusual reaction. This was explained to the patient and precautions advised for the future. He has since done well with no repetition of the episode.

Another patient complained of severe nausea and a feeling of warmth in the face while having an antifreeze solution placed in her car. She described the fumes as heavy, and exposure was somewhat prolonged.

One patient, meeting a friend in a restaurant, was urged to take a drink. The latter was thrust under his nose and he immediately vomited. Another patient vomited when, at a prize fight, a man nearby exhaled alcoholic fumes. It is apparent that these responses were on a purely psychogenic basis. These impromptu reactions have been noted elsewhere in the literature. It is well to emphasize to the patient what can and may occur in the absence of care.

SUMMARY

Tetraethylthiuramdisulfide is an additional adjunct in the approach to the alcoholic. Its use involves careful study and its value lies in the fact that it may institute an aversion to alcohol, since exposure of a previously sensitized person will instigate a severely disagreeable physical reaction. Thus, it can enable the patient to utilize more effectively psychotherapeutic procedures. By no means is it to be used without accompanying psychotherapeutic supervision. In cases in which the therapist has had difficulty in maintaining therapy because of the patient's constant and continuous intoxication, tetraethylthiuramdisulfide can help the patient to maintain sobriety so that he is reached. Tetraethylthiuramdisulfide can then enhance the patient's efforts to secure the necessary change in his behavior patterns, to readjust socially, to find renewed confidence, and to disrupt those paralyzing mechanisms involved in the use of alcohol.

Great care, however, should be exerted in the screening of the candidate for the drug. Study should include a careful physical and neuropsychiatric survey together with evaluation of environmental factors. From the purely physical point of view, great stress should be placed on the presence of a sound cardiovascular system, inasmuch as the outstanding fact in the tetraethylthiuramdisulfide-alcohol phenomenon is a profound vasomotor reaction. Psychiatric experience has indicated that there must be some positive reassurance that the patient is willing and able to give up his drinking as a means of gratification. Those who have demonstrated great insecurity, active resistance to help, prominent projective trends, and extreme difficulties in adjusting to people and situations are not usually good candidates for tetraethylthiuramdisulfide therapy. Further, the patient must be able to utilize help in a constructive manner, such as would be demonstrated in a therapeutic setting.

Administration of the drug initially is carried out in a hospital environment according to a definite schedule. Prior to discharge a reaction with a test dose of an alcoholic beverage of the patient's choosing is caused. The physical disturbance resulting is marked, affecting the cardiovascular, respiratory, and gastrointestinal systems. One should be prepared to deal promptly with the severe shock-like state often produced. There is some evidence that a decreased initial dosage of tetraethylthiuramdisulfide and a decreased test dose of alcohol result in less violent reactions. However, the effect of tetraethylthiuramdisulfide should serve to deter the patient from drinking, and a very mild reaction may not create a genuine fear of drinking.

At the suitable time the patient is discharged from the hospital on a maintenance dose of the drug and followed in the outpatient department. Reinforcement reactions are held periodically as indicated. Minor side-reactions to the drug over a period of time are common initially and consist of lassitude, occasional nausea, and abdominal cramps. These are usually transient. One very severe allergic reaction attributable to tetraethylthiuramdisulfide has been seen. It has been our experience that a decreased maintenance dose of tetraethylthiuramdisulfide serves to alleviate these side-reactions in many. The question as to whether a toxic factor is involved is extremely difficult to answer. We feel that the solution lies in considering the problem as the result of the combined action of alcohol removal, new stresses, toxicity of the drug, and the personality organization of the patient.

Important in the subsequent study of this group over an extended period has been the incidence of disorganization. This has been seen in eight patients, in whom three psychotic reactions were relatively mild and easily controlled. However, in the remaining five, the psychotic episodes were sufficiently severe to cause cessation of the drug. The etiology for this breakdown is felt to center about the severe threat presented by the maintenance of sobriety and, similarly, the combined and apparently inseparable threat of tetraethylthiuramdisulfide and psychotherapy. The alcoholism in many of these persons is merely a defense against a major emotional disturbance that appears when alcohol is suddenly removed and the patient loses the protective mechanisms necessary to handle increased anxiety and stress. In others the psychotic reaction appears to be a response that was used for the first time by an essentially neurotic person. We have been unable to evaluate completely the toxic factors and are continuing research in this area.

It is significant that, of 32 patients studied over a period of eight months, 16 (50%) continue tetraethylthiuramdisulfide therapy and remain in contact with the clinic. Of these, 10 (31%) have maintained complete sobriety; 6 (19%) have had intermittent relapses but have returned to the regimen.

Frequently, the patient under the strong temptation to drink may voluntarily cease taking his medication. Effective psychotherapeutic techniques will do much toward averting such action. Again, some patients may imbibe while taking the drug and unexpected reactions may occur outside of the hospital environment. It is important that one be aware of the possibility of such an occurrence in dealing with what appears to be simply alcoholic intoxication. The importance of carrying the antabuse® card at all times is stressed to patients.

51 Coventry St.

THE CAROTID SINUS

ITS CLINICAL IMPORTANCE

Elwyn Evans, M.D., Orlando, Fla.

It has been known for many years that pressure in the region of the carotid sinus might produce slowing of the heart, unconsciousness, and convulsions. These effects were ascribed to stimulation of the vagus nerve until the anatomic and physiological studies of Hering.[1]

Weiss and Baker[2] in 1933 called attention to the fact that a hypersensitive carotid sinus reflex was responsible for spontaneous attacks of vertigo, syncope, convulsions, and lesser symptoms. They described three types of carotid sinus syndrome: (1) the cardioinhibitory, or vagal, type with cardiac slowing or asystole, which is prevented by atropine; (2) the vasodepressor type, in which there is a decided drop in blood pressure not related to bradycardia, which may be prevented by epinephrine but not atropine; and (3) the cerebral type, in which there is loss of consciousness without significant cardiac slowing or drop in blood pressure and is not affected by atropine or epinephrine. Ferris and his co-workers[3] found 34% to be of the cardioinhibitory type, 5.3% of the vasodepressor type, and 60.7% of the cerebral type. They also described mixed forms.[4] Procainization of the carotid sinus abolished all types. Galdston and co-workers[5] studied 100 patients by continuous recording of the pulse rate and blood pressure with direct intra-arterial measurements. Twenty-six had syncope and convulsions on carotid sinus pressure, but only three had spontaneous attacks. They found that combined vagal and depressor response was the commonest, with pure vagal response next in frequency. In the author's series of 20 patients with spontaneous syncope, all showed vagal response during induced attacks. Ten were reported previously.[6] Of 10 patients whose complete mechanism was studied, 5 showed the vagal type, 4 vagal and vasodepressor types, and 1 vagal and cerebral type. In the latter, cerebral response predominated on one occasion, and vagal response predominated at other times. Of three other patients who previously showed vagal response, none showed significant response of any kind when studied during symptom-free intervals. Three more patients are reported but not included in the statistical analysis. One patient with faintness, but not syncope, is reported because he is the son of a patient with vagal syncope. Another patient, also the son of a patient with vagal syncope, is reported because of two spells of syncope at the time of his father's death, although he showed only carotid sinus hypersensitivity and dizziness during carotid sinus pressure when examined two months later. A third patient, with a hyperactive carotid sinus reflex, cataplexy, and narcolepsy, is the father of a patient with carotid sinus syncope plus narcolepsy and probably cataplexy.

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[1] Hering, H. E.: Der Kerotisdruckversuch, München. med. Wchnschr. **70**: 1287, 1923; Die Karotissinusreflexe auf Herz und Gefässe, vom normal-physiologischen, pathologisch-physiologischen und klinischen Standpunkt. Gleichzeitung über die Bedeutung der Blütdruckzügler für den Normalen und abnormen Kreislauf, Dresden, Theodor Steinkopff, 1927.

[2] Weiss, S., and Baker, J. P.: The Carotid Sinus Reflex in Health and Disease: Its Role in the Causation of Fainting and Convulsions, Medicine **12**: 297, 1933.

[3] Ferris, E. B., Jr.; Capps, R. B., and Weiss, S.: Carotid Sinus Syncope and Its Bearing on the Mechanism of the Unconscious State and Convulsions: Study of 32 Additional Cases, Medicine **14**: 377, 1935.

[4] Weiss and Baker.[2] Ferris, Capps, and Weiss.[3]

[5] Galdston, M.; Goldstein, R., and Steele, J. M.: Studies of the Variation in Circulatory and Respiratory Responses to Carotid Sinus Stimulation in Man, Am. Heart J. **26**: 213, 1943.

[6] (*a*) Evans, E.: The Carotid Sinus Syndrome, Geriatrics **4**: 90, 1949; (*b*) Carotid Sinus Syncope Associated with the Neurovascular Syndrome Simulating Serious Disease of Nervous System, J. A. M. A. **139**: 226 (Jan. 22) 1949.

Carotid sinus syndrome should be differentiated from the hyperactive carotid sinus reflex; the former is associated with syncope, but the latter is not.

Spells of unconsciousness may ocur abruptly, but a definite aura usually is present; dizziness, weakness, spots before the eyes, ringing in the ears, or epigastric distress may precede the attack. Hyperpnea, perspiration, and pallor usually occur, and vertigo [7] is usually prominent during attacks. Attacks usually last a few seconds to 15 or 20 minutes but average 1 to 4 minutes. The patient usually feels well between attacks; however, cases have been mentioned in which fatigue persisted for a day or more after an attack.[8] I recently observed a patient with an extremely sensitive carotid sinus, hypertension, advanced coronary disease, and congestive heart failure who stated that he thought he was going to die during chiropractic manipulation of his neck and felt exhausted for a day or so after treatment (see upper electrocardiogram in the accompanying figure).

In spite of numerous publications, the hyperactive carotid sinus is still an important and perplexing problem.

ETIOLOGY

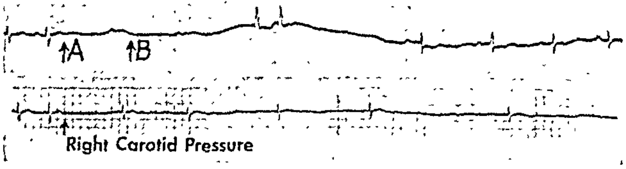
There is no satisfactory explanation why the carotid sinus becomes hyperactive in some patients, although we do know that there are several predisposing factors, including age, sex, vascular disease, especially cerebral and cardiac, medications, fatigue, emotional states, and organic diseases that increase vagal tone. It is also possible that changes in the wall of the sinus itself play a part and that there may be some familial predisposition.

In my series, the immediate family history was suggestively positive in 8 of 14 cases in which the family history of syncope was checked. The father had spells of unconsciousness in six cases; a son had spells of unconsciousness in one and faintness in another. Both sons had hyperactive carotid sinus reflexes when examined during periods when they felt well. The father of one patient with carotid sinus syncope, narcolepsy, and probably cataplexy, had hyperactive carotid sinus reflexes, narcolepsy, and cataplexy (see lower electrocardiogram in the accompanying figure). The father had spells of sleepiness and weakness, often associated with falling, precipitated by laughing or excitement. During his examination, he had a spell of weakness and collapsed without significant circulatory change. Carotid sinus pressure caused significant bradycardia and drop in blood pressure without symptoms. The family history is of further interest in this case because three of the father's uncles had spells of sleepiness, and one tended to fall and drop a violin while playing it. The latter possibly had carotid sinus syncope.

All reports emphasized age and sex. Males ranged from 85% [7] to 94%.[9] Draper,[10] in reviewing 59 cases reported in detail, found 86.5% to be in males. In my series, 80% were in males. Of the 59 cases reviewed by Draper,[10] 2 of the patients were in the third decade, 4 in the fourth, 6 in the fifth, 20 in the sixth, 21 in the seventh, and 5 in the eighth. In my series, ages ranged from 39 to 78 years, averaging 59.2 years. Hyperreactors also predominate in the upper age brackets. Seventy per cent of Nathanson's [9] 115 patients were between 50 and 70 years of age. Incidentally, 77 of his patients were without symptoms suggestive of carotid sinus syndrome. Sigler,[11] testing 1,151 males and 735 females, found that the incidence increased in adult life and reached a fastigium in middle life.

Various drugs are known to accentuate carotid sinus sensitivity, especially the vagal type.[12] These include mecholyl, morphine, digitalis, nitrites, caffeine, calcium, nicotinic acid, nicotine, strychnine, thyroid extract, eserine, salicylates, potassium cyanide, and light chloroform anesthesia. Alcohol is one of several drugs that reduces carotid sinus sensitivity.[13] One of my patients noted complete freedom from carotid sinus symptoms while under the influence of alcohol but noticed an exaggeration of the symptoms on the following day.

Heart disease predisposes to carotid sinus irritability, especially the cardioinhibitory type. Sigler [11] found that 93% of the patients with demonstrable coronary sclerosis showed significant bradycardia on carotid sinus pressure and that 55% in groups without heart disease showed significant bradycardia. According to Nathanson,[12g] 34 of his first 40 patients showing cardiac standstill following carotid sinus pressure had angina, and one-third of the patients with coronary disease and



Upper: A, right carotid sinus pressure. *B*, pressure released. Note immediate complete A-V block and sinus bradycardia followed by sinus arrest, two ectopic ventricular beats, and, finally, sinus bradycardia with partial A-V block after carotid sinus pressure of 1⅕ seconds. The patient was lying down and had no symptoms. *Lower:* Right carotid sinus pressure applied at *A*. Blood pressure dropped from 126/84 before carotid pressure to 102/66 one minute after the pulse rate returned to normal. It was 108/72 and 112/76 three and seven minutes later, respectively. The patient had no symptoms during the bradycardia and fall in pressure despite the erect position.

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7. Smith, H. L.: A Consideration of the Hyperactive Carotid Sinus Reflex Syndrome, M. Clin. North America **31**: 841, 1947.

8. Weiss and Baker.[2] Evans.[6b]

9. Nathanson, M. H.: Hyperactive Cardioinhibitory Carotid Sinus Reflex, Arch. Int. Med. **77**: 491, 1946.

10. Draper, A. J.: The Cardioinhibitory Carotid Sinus Syndrome, Ann. Int. Med. **32**: 700, 1950.

11. Sigler, L. H.: Hyperactive Cardioinhibitory Carotid Sinus Reflex; Possible Aid in Diagnosis of Coronary Disease, Arch. Int. Med. **67**: 177, 1941.

12. (*a*) Weiss and Baker.[2] (*b*) Downs, T. M.: The Carotid Sinus as an Etiologic Factor in Sudden Anaesthetic Death, Ann. Surg. **99**: 974, 1934. (*c*) Ruzicka, E. R., and Eversole, W. H.: The Carotid Sinus in Anesthesiology: Report of 2 Cases, Lahey Clin. Bull. **3**: 47, 1942. (*d*) Sigler, L. H.: Tobacco and the Cardioinhibitory Carotid Sinus Reflex, M. Rec. **145**: 18, 1937. (*e*) Palitz, L.; Frist, T. F., and Kocour, E.: The Effects of Pressure on the Carotid Sinus at Various Altitudes: Case Reports, J. Aviation Med. **14**: 346, 1943. (*f*) Nichol, A. D., and Strauss, H.: The Effects of Digitalis, Urginin, Congestive Cardiac Failure, and Atropine on the Hyperactive Carotid Sinus, Am. Heart J. **25**: 746, 1943. (*g*) Nathanson, M. H.: Rhythmic Property of the Human Heart, Arch. Int. Med. **72**: 613, 1943.

13. Ferris, Capps, and Weiss.[2] Draper.[10]

angina were hyperreactors. Sigler[14] stated that a high degree of carotid sinus hyperactivity rarely occurred in the absence of coronary disease. In my series, 13 of 20 patients with carotid sinus syncope had obvious heart disease, 4 had myocardial infraction, 1 left bundle branch block and probably infarction, 3 angina without infarction, 3 hypertension and angina (1 with congestive heart failure), and 1 cardiac enlargement only. Another had a positive reaction to the exercise tolerance test[15] only. Two of those without definite heart disease had widespread arteriosclerosis otherwise, 3 had spontaneous episodes of temporary hemiplegia, and 1 had temporary monoplegia.

The carotid sinus reflex varies with the heart rate. Sigler[16] found the reflex to be absent in patients with marked bradycardia, greatest in patients with moderate bradycardia and greatly diminished in those with tachycardia. Increased vagal tone increased the activity of the reflex up to a certain point, beyond which it decreased.

Nathanson[9] attributed the cardioinhibitory response predominantly to vagal hypersensitivity, although he stated that it was possible that the structure of the carotid sinus in some persons was such that intrasinal pressure changes were easily transmitted to the sensory endings in the adventitia, resulting in cardiac inhibition and symptoms. The author found that the right carotid sinus was more dilated and more sensitive than the left in seven of eight patients in whom the sensitivity of both sinuses was carefully checked.[6a] He also found varying degrees of sclerosis of the sinus in 17 of 20 patients with syncope. It is of interest, however, that many patients with obvious sclerosis of the carotid sinus show no hyperactivity.

According to Sigler,[17] patients who had cerebral arteriosclerosis showed the most alarming cerebral symptoms.

Jones[18] reported a case in which inflammatory regional lymph nodes were a contributing factor.

Engel and Engel[19] found that 18 of 23 patients with acute symptoms arising in the biliary tract showed cardiac standstill of three seconds or more after carotid sinus massage. Carotid sinus hypersensitivity disappeared in 7 of 10 examined postoperatively. They interpreted these results as showing summation of afferent impulses from end organs in the biliary tract, which had reached the threshold of reaction of vagal centers in the medulla.

Several investigators emphasized emotional upsets, worry, and neurotic states in the cerebral form.[20] Evans[6a] emphasized the importance of emotional factors in the cardioinhibitory, or vagal, form. Variation in such states could readily account for some of the variability in the sensitivity of the carotid sinus. Episodes of syncope in 19 of the 20 cases in the present series were most likely to occur during periods of emotional strain or fatigue, regardless of the mechanism or combination of mechanisms. It is possible, however, that variation in the cerebral factor played a part in apparent vagal forms, because the two factors often coexist.[21] That cerebral factors played a part in many patients with vascular response was shown by Lennox and co-workers,[22] who demonstrated that even in patients with cardiovascular responses the degree of cerebral circulatory slowing was not as marked as could be produced by other procedures that did not result in loss of consciousness. Galdston and co-workers[5] found that two or more types usually occurred simultaneously, but one type predominated. They also mentioned cases in which syncope and convulsions occurred on stimulation of the side that produced the lesser degree of circulatory change and failed to occur on the side that caused the more marked circulatory response. Evans[6b] reported a case in which the cerebral form predominated on one occasion and the vagal form on other occasions.

Precipitating factors have been reported in 25% to 30% of the patients.[23] The commonest factors were sudden movements of the head, assumption of the erect position, stooping, coughing, straining at stool, shaving, tight collars, or anything causing pressure on the carotid sinus. In the present series, precipitating factors were noted in 10 of 20 cases. The notorious tight collar was a factor in three patients.

INCIDENCE

The incidence of spontaneous major seizures is unknown, but it is not uncommon, especially in males with coronary disease in the upper age brackets. Cope and associates[24] described 11 instances of spontaneous major seizures during a period in which they saw 11 patients with peptic ulcers, 4 with diabetes, 3 with active pulmonary tuberculosis, 10 with syphilis, and 1 with pernicious anemia. Weiss and Baker[2] reported 15 cases in 1933, and Ferris, Capps, and Weiss[3] observed a total of 56 through the next three years. Smith[25] reported 85 cases at the Mayo Clinic by 1937.

Overactivity of the carotid sinus without syncope is doubtless common. This is also affected by age, sex, vascular disease, and other factors. Nathanson[9] stated cardiac inhibition was as intense and as easily elicited in the asymptomatic group as it was in the group with symptoms.

DIAGNOSIS

Diagnosis is made from the history and by inducing an identical attack by pressure on one of the carotid sinuses. While the sensitivity of the carotid sinus is being tested, the patient preferrably should be in the sitting position, with the head tipped slightly backward and turned away from the side being examined. The sinus usually is situated below the angle of the jaw at the upper border of the thyroid cartilage. Sometimes the carotid bulb is readily palpable. Pressure is gradually made with the thumb so that the sinus is compressed against the spinal column.[26] Sudden pressure is undesirable, and massage should be avoided.[9] Unduly prolonged pressure may be fatal.[27] As a rule, characteristic response will occur in 10 to 25 seconds. Bilateral stimulation is dangerous,[20b] and repeated stimulation should not be done after diagnosis is made, because of occasional serious complications.[28] Askey described seven cases of hemiplegia that occurred immediately after carotid sinus pressure.[28e]

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[14] Sigler, L. H.: The Hyperactive Cardioinhibitory Carotid-Sinus Reflex as an Aid in the Diagnosis of Coronary Disease: Its Value Compared with That of the Electrocardiogram, New England J. Med. **226**: 46, 1942.

[15] Master, A. M.; Friedman, R., and Dack, S.: The Electrocardiogram After Standard Exercise as a Functional Test of the Heart, Am. Heart J. **24**: 777, 1942.

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[17] Sigler, L. H.: Subjective Manifestations of the Hyperactive Carotid Sinus Reflex, Ann. Int. Med. **29**: 687, 1948.

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[19] Engel, G. L., and Engel, F. L.: The Significance of the Carotid-Sinus Reflex in Biliary-Tract Disease, New England J. Med. **227**: 470, 1942.

[20] (*a*) Weiss and Baker.[2] Ferris, Capps, and Weiss.[3] (*b*) Weiss, S.; Capps, R. B.; Ferris, E. B., Jr., and Munro, D.: Syncope and Convulsions Due to a Hyperactive Carotid Sinus Reflex: Diagnosis and Treatment, Arch. Int. Med. **58**: 407, 1936.

[21] Weiss and Baker.[2] Ferris, Capps, and Weiss.[3] Galdston, Goldstein, and Steele.[5]

[22] Lennox, W. G.; Gibbs, F. A., and Gibbs, E. L.: Relationship of Unconsciousness to Cerebral Blood Flow and to Anoxemia, Arch. Neurol. & Psychiat. **34**: 1001, 1935.

[23] (*a*) Smith, H. L., and Moersch, F. P.: Further Study on the Hypersensitive Carotid Sinus Reflex Syndrome: Report of 31 Additional Cases, Proc. Staff Meet., Mayo Clin. **11**: 380, 1936. (*b*) Draper.[10]

[24] Cope, R. L.; Engelhardt, H. T., and Baird, V. C.: The Carotid Sinus Syndrome: Its Importance in Clinical Medicine, Texas State J. Med. **44**: 30, 1948.

[25] Smith, H. L.: Fainting Attacks Resulting from Hypersensitive Carotid Sinus Reflexes, Am. Heart J. **14**: 614, 1937.

Carotid sinus syncope should be considered in the differential diagnosis when dizziness, faintness, and unconsciousness, with or without convulsions, are present. Other conditions that frequently must be differentiated are idiopathic epilepsy (petit and grand mal); narcolepsy; cataplexy; postural hypotension; hypoglycemia; several cardiac disturbances associated with asystole, tachycardia of various sorts, and aortic stenosis; and vasovagal syncope. The latter is the commonest cause of syncope, and its relation to sudden emotional stimuli, such as the sight of blood, fright, and pain, is usually clear. The onset of the attack is associated with sweating. In postural hypotension, the drop in blood pressure and transient unconsciousness are associated with assumption of the upright position. Although carotid sinus syncope may be precipitated by pain or assumption of the upright position, it may be differentiated from the previous conditions by being reproducible on carotid sinus pressure. Spontaneous hypoglycemia usually occurs two to four hours after meals and is associated with a low blood sugar level. Weiss and Baker [2] and Freedberg and Sloan [29] were unable to find any relation of the carotid sinus to idiopathic epileptic seizures. Robinson [30] examined 1,000 institutional patients with epilepsy, all of whom had been admitted because of syncope, convulsions, or transient loss of consciousness, and found that nine (0.9%) had a hyperactive carotid sinus reflex.

Differentiation in patients with heart disease is not always easy. Various degrees of heart block sometimes persist in patients with Adams-Stokes attacks. Auricular and ventricular tachycardia and auricular fibrillation or flutter may be noted during attacks in patients whose unconscious spells are associated with these disorders. Cookson [31] found 15 syncopal or epileptiform attacks in 200 patients with acute myocardial infarction. I found extremely sensitive carotid sinuses in two patients who had spells of unconsciousness during several attacks of myocardial infarction. Levine [28d] stated that syncope and angina were peculiarities of aortic stenosis. He thought that syncope could be linked up with peculiarities of the carotid sinus reflex but stated that, in most cases of aortic stenosis, normal sensitivity of the carotid sinus was found. Syncope in aortic stenosis usually occurs on exertion. An unusual clinical syndrome, consisting of glossopharyngeal tic douloureux and cardiac arrest, has been reported.[32] It consists of pain in the pharynx and at the base of the tongue, cardiac slowing or arrest, fall in blood pressure, and occasionally syncope.

Occasionally other diseases, especially Ménière's disease, may complicate the picture.[23a] Craig and Smith [33] described a case in which division of the upper portion of the eighth nerve relieved syncopal attacks after carotid sinus denervation failed. In one of my patients, pronounced vertigo was relieved elsewhere by intracranial division of the vestibular division of the eighth nerve, but syncope and convulsions were not relieved until both carotid sinuses were denervated.[6a] The neurovascular syndrome [34] complicated the diagnosis in one case previously reported.[10] This is a syndrome in which paresthesias, numbness, and pain in the fingers and hand appear in certain persons when the arm is hyperabducted. Narcolepsy and probably cataplexy were associated with carotid sinus syncope in another case. The patient, a 39-year-old man, had spells of sleepiness, weakness precipitated by laughing, and unconsciousness. Unconsciousness could be produced by carotid sinus pressure, which caused bradycardia and a fall in blood pressure.

To avoid error in diagnosis, it is important to remember that many persons who exhibit symptoms on carotid sinus pressure do not have spontaneous attacks. Even unconsciousness and convulsions occur in some patients who never have spontaneous attacks. It is also well to remember that some patients who complain of dizziness, faintness, or unconsciousness without evidence of disease of the central nervous system do not have them on the basis of carotid sinus sensitivity.

PROGNOSIS

Prognosis for patients with the carotid sinus syndrome per se is good. Many patients with mild symptoms are not affected seriously, but those with serious symptoms may be greatly handicapped. It is possible that in rare instances marked spontaneous carotid sinus overactivity may be the cause of cerebral vascular accidents. Temporary hemiplegia in three of my patients possibly could

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33. Craig, W. M., and Smith, H. L.: The Surgical Treatment of Hypersensitive Carotid Sinus Reflexes: Report of 13 Cases, Yale J. Biol. & Med. **11**: 415, 1939.

34. Wright, I. S.: The Neurovascular Syndrome Produced by Hyperabduction of the Arms: Immediate Changes Produced in 150 Normal Controls, and Effects on Some Persons of Prolonged Hyperabduction of Arms as in Sleeping, and in Certain Occupations, Am. Heart J. **29**: 1, 1945.

have been on this basis. In any event, one can readily realize the danger in certain occupations and driving cars. Two patients in the present series had minor automobile accidents during syncope, and another fell and fractured her arm.

In general, prognosis depends on associated diseases, especially coronary and cerebral arteriosclerosis and hypertension, so that accurate prognosis requires the evaluation of these diseases.

TREATMENT

If the symptoms are mild and the attacks infrequent, no treatment other than explanation of the attack and reassurance are necessary. Fatigue, worry, and emotional upsets should be avoided if possible. Patients should be instructed to avoid factors that precipitate attacks, especially turning the head quickly, looking up, arising or stooping suddenly, and wearing tight collars. Sedatives are helpful. Banthine® (beta-diethylaminoethyl xanthene-9-carboxylate), 50 to 100 mg., three or four times daily, controlled symptoms in six of my patients, although the carotid sinus reflex was still somewhat hyperactive on carotid sinus pressure in four. A fifth patient, a 46-year-old man, who had predominately the vagal type of syncope during three periods of carotid sinus irritability in 11 years, took banthine® for two months. Two months after he stopped medication, the carotid sinus was not found to be sensitive. Longino and co-workers [35] were able to block the vasopressor effect of bilateral carotid sinus pressure with this drug. Other drugs that have been particularly useful are atropine in the vagal type and ephedrine in the vasodepressor type.

Surgery [36] is sometimes necessary in severe conditions not responding to medical management. Preliminary procaine injection should be made to test response. Craig and Smith [33] denervated the sinus in 12 cases and had excellent results in 4, good in 1, fairly good in 4, and poor results or failures in 3. Turner and Learmonth [37] reported a case in which bilateral denervation cured the patient without ill effects. Severe vertigo was alleviated by intracranial section of the vestibular portion of the eighth nerve of one of my patients, but bilateral denervation of the carotid sinus was necessary to relieve syncope and convulsions. Now, two years after his operation, he still has carotid sinus hypersensitivity, so that he cannot wear a tight collar, get up quickly, or turn his head suddenly. Previously, sinus pressure immediately caused asystole, syncope, and convulsions. Now, slight pressure causes dizziness and ectopic ventricular beats without significant blood pressure changes. Ray and Stewart [38] found that intracranial division of the glossopharyngeal nerve permanently abolished the effects of pressure on the homolateral sinus. They considered this procedure valuable when a condition of local tissues might make local surgery undesirable or impossible. In some cases, removal of local pathology is curative.[18] Stevenson and Moreton [39] treated 24 patients with roentgen therapy. In 16 the condition was of the vagal and in eight of the cerebral type. Complete relief was obtained in 44% and partial relief in 25%.

SUMMARY AND CONCLUSIONS

1. The clinical importance of the hyperactive carotid sinus reflex and carotid sinus syncope is discussed.
2. Twenty cases of carotid sinus syndrome, one possible carotid sinus syndrome, and two interesting cases of the hyperactive carotid sinus reflex are discussed.
3. The carotid sinus syndrome is an important disease that is commonly overlooked and is doubtless more frequent than generally realized.
4. It is predominantly a disease of men in the upper age brackets but should be suspected in all patients with dizziness, faintness, syncope, or convulsions.
5. Emotional states, such as anxiety or worry, and fatigue are usually associated with exacerbation of symptoms in the vagal as well as in the cerebral and mixed forms of carotid sinus syncope.
6. The carotid sinus may not be found to be hyperactive on pressure during periods when the patient is without symptoms.
7. Family histories suggest a familial tendency.
8. Other diseases, particularly coronary or cerebrovascular disease, are usually present, and prognosis mainly depends on these diseases.
9. Complicating diseases, such as the neurovascular syndrome, Ménière's disease, narcolepsy, and cataplexy in this series, may make the diagnosis appear more difficult or the prognosis appear more serious.
10. Most patients respond well to medical management, but occasionally surgery is necessary. Banthine® (*beta-diethylaminoethyl xanthene-9-carboxylate*) appeared to be clinically effective in six cases in which it was used.

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Estimate of Future Number of Veterans.—The United States Government is building for use by the Veterans Administration 78 new hospitals to add to the 136 now in operation. This multimillion dollar venture, which will bring the total bed capacity of Veterans Administration Hospitals up to 143,000, is only a fraction of a tremendous building program which will allegedly be required to care for the estimated 300,000 veterans who will be sick by 1975. Such estimates, furthermore, are only on the basis of our current veterans population of 19,000,000 souls. Stable, indeed, would be the imagination which did not reel at the prospect of the further expansion which, if this policy is continued, will follow the Korean War and universal military service. Under present methods of interpreting eligibility laws the number of eligibles for care will eventually not fall far short of a figure which will include all the adult males, and many of the females, in the country, and so reach an order of magnitude of over 60,000,000.—Richard Warren, M.D., Are Veterans People? *Connecticut State Medical Journal*, March, 1952.

EFFECTS OF BARBITURATE SEDATION ON THE BRAIN IN TOXEMIA OF PREGNANCY

Milton L. McCall, M.D.
and
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Recently quantitative studies of cerebral circulation and metabolism have been carried out on women with toxemia of pregnancy.[1] It was found that the cerebral blood flow was not affected by any type of toxemia. The most striking departure from normal was the presence of a greatly increased cerebrovascular resistance, thought to be due to vasospasm. In eclampsia with convulsions, there was a depression of cerebral oxygen metabolism. This knowledge has given us a new insight into the pathophysiology of the brain in toxemia of pregnancy and has opened the way to the evaluation of the effects of therapy on this organ.[2]

In modern times one of the most important aspects of therapy in this disease of obscure causation has been the use of large amounts of sedatives in an attempt to prevent or allay convulsions by depressing the central nervous system. The mechanism of this cerebral depression has not been clearly understood, and it would appear to be of the utmost importance to evaluate the drugs that affect the nervous system in this way, especially since toxemia itself may bring about a depression of cerebral oxygen metabolism.

At present the barbiturates are probably used as frequently in toxemia as are any other group of sedatives. Since Fischer and Von Mering [3] first demonstrated the hypnotic effect of barbituric acid, in 1903, many barbiturate derivatives have been used in toxemia. This report deals with the effects of three of the most popular members of the group, amobarbital (amytal®) sodium, thiopental sodium, and phenobarbital (luminal®) sodium.

METHODS AND MATERIAL

The method of Kety and Schmidt [4] was used. This involves the simultaneous withdrawal of venous blood from the jugular bulb and arterial blood from the femoral artery over a period of 10 minutes while the patient is breathing a mixture of 15% nitrous oxide, 21% oxygen, and 64% nitrogen. Mean arterial blood pressure is measured directly from the femoral artery with a damped mercury manometer. Blood gas analyses of nitrous oxide, oxygen, and carbon dioxide were made with the Van Slyke-Neill apparatus. As previously described,[1] cerebral blood flow (CBF) was measured in cubic centimeters per 100 gm. of brain per minute. Cerebral oxygen metabolism ($CMRo_2$) was calculated in cubic centimeters of oxygen utilized per 100 gm. of brain per minute, and cerebrovascular resistance (CVR) in millimeters of mercury pressure per cubic centimeter of blood flow per 100 gm. of brain per minute. The respiratory quotient (RQ) was calculated by computing the relationship between the oxygen uptake by the brain and the amount of carbon dioxide given off $\frac{(V\text{–}A\ co_2)}{(A\text{–}V\ o_2)}$.

Thirty-two women in the latter weeks of pregnancy were studied; 15 had preeclampsia per se, and 17 had acute toxemia superimposed on mild essential hypertension. It had been shown in our earlier work that there is no significant difference between these two types of nonconvulsive toxemia as far as cerebral function is concerned. No therapy was given for at least 12 hours before the control experiment (C). Immediately after the first flow the sedative being studied was administered, and the second observation (E) was carried out as soon as the drug had taken effect.

RESULTS

Amobarbital Sodium.—Amobarbital (isoamylethyl barbituric acid) was first described by Shonle and Moment,[5] in 1923. In 1926 Page and Coryllos [6] prepared the sodium salt and used it to anesthetize animals experimentally. Zerfas and his co-workers [7] in 1929 reported on the induction of anesthesia in man by its intravenous use. Since that time amobarbital sodium has been used extensively in toxemia of pregnancy.[8]

Eleven patients were given amobarbital sodium in 10% solution intravenously until unconsciousness took place. The dosage varied from 3¾ to 7½ grains (0.23 to 0.50 gm.). Deep anesthesia was avoided in every case, and, in the majority of instances, the patients were restless and reacting by the end of the 10-minute period of the experiment.

TABLE 1.—*Mean Effects of Use of Amobarbital Sodium on Cerebral Function**

MABP Mm. Hg		A—Vo_2 Vol. %		CBF Cc./100 Gm. Brain/Min.		$CMRo_2$ Cc./100 Gm. Brain/Min.		CVR Mm. Hg Cc./100 Gm. Brain/Min.		RQ	
C	E	C	E	C	E	C	E	C	E	C	E
125	113†	6.5	5.6‡	59	48§	3.8	2.7†	2.3	2.4	0.90	1.10

* MABP, mean arterial blood pressure; A—Vo_2, arteriovenous oxygen difference; CBF, cerebral blood flow; $CMRo_2$, cerebral oxygen metabolic rate; [illegible] istance; RQ, respiratory quotient; C, control

† [illegible] ange ($p < 0.01$).

‡ [illegible] ange ($p < 0.05$).

§ [illegible] ange ($p < 0.02$).

As seen in table 1, the mean arterial blood pressure (MABP) was significantly lowered from a mean of 125

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Read before the Section on Obstetrics and Gynecology at the One-Hundredth Annual Session of the American Medical Association, Atlantic City, June 13, 1951.

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to 113 mm. Hg. The arteriovenous oxygen difference (A—Vo_2 was significantly depressed from 6.5 to 5.6 vol. %. The cerebral blood flow was reduced from 59 to 48 cc. per 100 gm. of brain per minute, and there was a highly significant lowering of oxygen utilization by the brain ($CMRo_2$) from the pretreatment level of 3.8 to 2.7 cc. per 100 gm. of brain per minute following the administration of amobarbital sodium. The cerebrovascular resistance (CVR) was essentially unchanged by this type of sedation, being 2.3 before and 2.4 mm. Hg per cubic centimeter per 100 gm. of brain per minute immediately thereafter. The respiratory quotient (RQ) remained within normal limits.

Thiopental Sodium.—Thiopental sodium, a short-acting thiobarbiturate, was introduced clinically in 1935 by Lundy.[9] Recently its use in toxemia of pregnancy has been fostered by Aubanel.[10] Short,[11] and Browne.[12]

Nine toxemic pregnant women were given this drug intravenously in a 2.5% solution until consciousness was barely lost. Total dosage varied from 0.2 to 0.9 gm. All patients reacted either during or shortly after the 10-minute experimental period that immediately followed the injection.

TABLE 2.—*Mean Effects of Use of Thiopental Sodium on Cerebral Function**

MABP Mm. Hg		A—Vo_2 Vol. %		CBF Cc./ 100 Gm. Brain/Min.		$CMRo_2$ Cc./ 100 Gm. Brain/Min.		CVR Mm. Hg Cc./100 Gm. Brain/Min.		RQ	
C	E	C	E	C	E	C	E	C	E	C	E
115	110	6.3	6.0	55	46†	3.4	2.7‡	2.1	2.4	1.0	1.0

* See footnote *, table 1.
† Statistically significant change ($p < 0.02$).
‡ Statistically significant change ($p < 0.001$).

As seen in table 2 the mean arterial blood pressure was lowered from 115 to 110 mm. Hg. The uptake of oxygen by the brain (A—Vo_2) was little affected, being 6.3 vol. % before and 6.0 vol. % after administration of the drug. Cerebral blood flow was significantly reduced from a mean of 55 cc. to 46 cc. per 100 gm. of brain per minute. There was a decided depression of the oxygen utilization by the brain from 3.4 cc to 2.7 cc. per 100 gm. of brain per minute. Cerebrovascular resistance was slightly increased after administration of thiopental sodium to 2.4 mm. from 2.1 mm. Hg per cubic centimeter per 100 gm. of brain per minute. The respiratory quotient was exactly unity before and after sedation.

Phenobarbital Sodium.—Phenylethyl barbituric acid (phenobarbital, [luminal®]) was patented in 1912. According to Lundy and Osterberg,[13] Hauptmann [14] in the same year was one of the first to report its use. It is a long-acting barbiturate reputed to be especially efficacious as an anticonvulsant in epilepsy.[15] Phenobarbital and its sodium salt have long been used in toxemia of pregnancy.

TABLE 3.—*Mean Effects of Use of Phenobarbital Sodium on Cerebral Function**

MABP Mm. Hg		A—Vo_2 Vol. %		CBF Cc./ 100 Gm. Brain/Min.		$CMRo_2$ Cc./ 100 Gm. Brain/Min.		CVR Mm. Hg Cc./100 Gm. Brain/Min.		RQ	
C	E	C	E	C	E	C	E	C	E	C	E
123	120	6.3	6.6	53	48	3.4	3.2	2.4	2.5	0.95	0.98

* See footnote *, table 1.

Twelve patients were given 7½ grains (0.50 gm.) of phenobarbital sodium intramuscularly after the completion of the control experiment. The second investigation was carried out an average of one hour after administration of the sedative. A surprising clinical feature was the fact that none of these patients showed more than slight drowsiness at the time of the second experiment. There were no significant deviations from normal cerebral function. The mean arterial blood pressure decreased from 123 mm. to 120 mm. Hg. Cerebral blood flow was lessened only 5 cc. per 100 gm. of brain per minute. The cerebral metabolic rate, in terms of oxygen, and the cerebrovascular resistance remained approximately the same as did the respiratory quotient.

BLOOD GASES

The oxygen content of the arterial blood was lowered from 14.6 to 13.9 vol. % by administration of amobarbital sodium and from 14.0 to 13.3 vol. % by administration of thiopental sodium. This must be regarded as due to slight desaturation of the blood with oxygen, inasmuch as there is no change in hemoglobin content or oxygen capacity in the few minutes between experiments. Mild respiratory depression by these intravenously administered sedatives with resultant minimal anoxic anoxia undoubtedly is the fundamental cause. There is no such depression of arterial oxygen following administration of phenobarbital sodium when the patient is still

TABLE 4.—*Mean Effects of Barbiturate Sedation on Blood Gases*

		Arterial				Internal Jugular			
		O_2 Content		CO_2 Content		O_2 Content		CO_2 Content	
		Vol. %				Vol. %			
No. of Patients	Drug	C*	E†	C	E	C	E	C	E
11	Amobarbital sodium	14.6	13.9‡	41.9	41.5	8.3	8.0	47.5	47.4
9	Thiopental sodium	14.0	13.3	40.0	39.5	7.6	7.3	45.6	45.6
12	Phenobarbital sodium	14.2	14.1	36.1	36.0	7.8	7.6	42.1	42.2

* Control flow.
† [illegible]
‡ [illegible] change ($p < 0.05$).

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awake and obviously affected to a lesser degree. The arterial carbon dioxide and the venous oxygen and carbon dioxide were not significantly affected by administration of any of the barbiturates.

COMMENT

This study shows that amobarbital sodium and thiopental sodium, intravenously administered in minimal doses to cause unconsciousness, bring about marked change in cerebral function in toxemic pregnant women. On the other hand, phenobarbital sodium administered intramuscularly in large dosage caused neither clinical effect nor significant change in cerebral function.

The cerebral oxygen metabolism was the function most affected. There was a 29% depression after administration of amobarbital sodium and a 21% depression after administration of thiopental sodium. It has been shown by Himwich and her co-workers [16] that full anesthetic doses of thiopental sodium in normal man lowers this function 36%. Wechsler, Dripps, and Kety [17] have further brought out that there is an increasing depression of cerebral oxygen metabolism as larger doses of the drug are given.

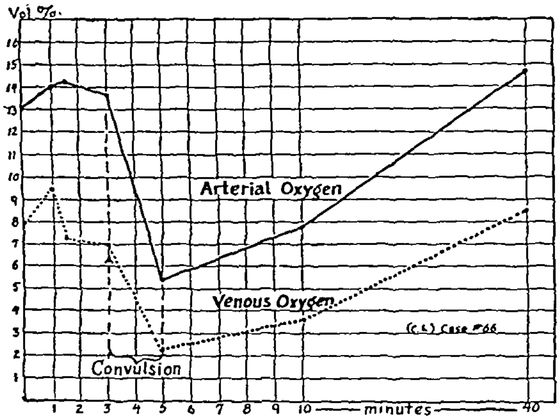

Fig. 1.—*Depression of arterial and venous oxygen in comatose state.*

The mechanism of this depression is not entirely clear. The fact that it takes place in the presence of a basically undiminished oxygen supply in the arterial blood being brought to the brain seems to validate the assumption that the brain cells themselves are unable to utilize oxygen as well. This resembles histotoxic anoxia and may be brought about by paralysis of some portion of the neuraxon, thus slowing down its activity, or an interference with the normal functioning of the enzyme systems.[18] As shown in our previous work, the same situation exists in the coma of eclampsia. In fact this is true in all types of coma thus far studied,[19] and there seems to be a correlation between the degree of mental clearness present and the level of the cerebral metabolic rate. There is one notable exception to this, for it has recently been shown [20] that in the physiological unconsciousness of normal sleep the oxygen metabolism of the brain remains normal. This at once brands the depressions brought about by coma and anesthesia as pathological.

Aside from the histotoxic anoxia present during the comatose stage of eclampsia, there is also anoxic anoxia due to respiratory difficulties during the convulsion. Although cyanosis and clinical evidence of anoxemia during this state is familiar, the full significance of the extent of this anoxia was not apparent until an eclamptic convulsion was experienced in the midst of a blood flow experiment.[21] Blood gas determinations were done immediately before, during, and after the episode. This, so far as we know, is the first case in which such observations have been made. During the first 10 minutes the patient breathed 85% oxygen and during the subsequent 40 minutes 100% oxygen.

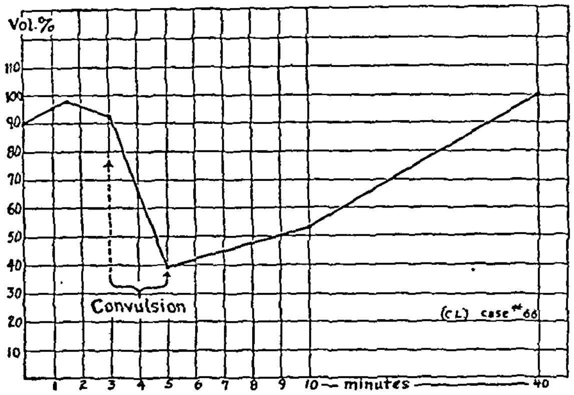

Fig. 2.—Saturation of hemoglobin with oxygen.

Figure 1 shows the depression of arterial oxygen from a level of 13.6 vol. %, 10 seconds before the convulsion started, to 5.8 vol. % toward the end of the convulsion. The venous concentration of oxygen shows a comparable depression. Figure 2 shows the great drop in oxygen saturation of the blood to a level of 39% during the convulsion and the gradual rise to normal after 40 minutes with inhalation of 100% oxygen. In figure 3 the uptake of oxygen by the brain (A—Vo_2) is shown to be decreased almost 50%, from 6.6 to 3.5 vol. %.

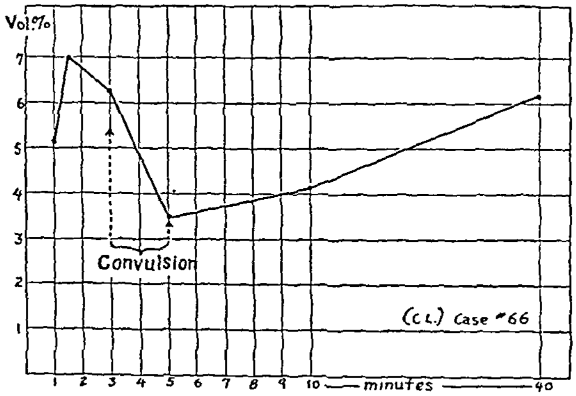

Fig. 3.—Uptake of oxygen by the brain.

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It is therefore evident that eclampsia is a disease associated with oxygen deprivation and deficient uptake of oxygen by the brain during the convulsive stage and a compromised cellular oxygen metabolism in the presence of normal oxygen supply during the comatose phase. At present there is no method capable of measuring cerebral blood flow in man at the very moment of convulsion. This has been done in animals,[22] and a great increase in oxygen metabolism and blood flow followed by reduced cerebral oxygen metabolism in the immediate postconvulsive phase, similar to that in man, has been shown.

From the practical point of view the question is immediately posed as to whether this type of sedation is harmful or efficacious when used in toxemia. If, in preeclampsia, convulsions with their deleterious effect on the brain can be prevented with moderate doses of sedation and relatively harmless transient depression, it would appear to be most desirable. If eclampsia occurs in spite of such therapy, however, the histoanoxic effect of the disease is superimposed on that of the drug. In eclampsia, although it is important to prevent repeated convulsions with their exhaustive effect on the brain, it also seems logical that the use of large and continued doses of drugs adding to the depression of the postconvulsive comatose state would be contraindicated from the standpoint of possible permanent cerebral damage. Selle [23] showed that certain barbiturates reduce survival time and activity of the primitive respiratory mechanism of isolated head preparations, which bears out this contention. Clinically we have repeatedly gained the impression that overtreatment with sedation not only prolongs the coma of eclampsia but also adds to the morbidity and mortality. We have found intravenously administered barbiturates to be particularly pernicious in this connection and have been especially perturbed by the restlessness and inevitable associated fatigue so often seen, which may be a manifestation of the histoanoxic state present within the brain.

The increase of cerebrovascular resistance, which is the most significant abnormality found in all types of toxemia of pregnancy, was not favorably affected by barbiturate sedation. In fact, there was a slight rise in the degree of vasospasm within the brain after the use of these drugs. It has been previously pointed out that barbiturates have a mild hypotensive effect [24] in man. This was also shown to be true in preeclampsia. This effect is reputed to be due to a combination of central effect and a local dilating action directly on the vascular musculature.[25] Our study reveals that the brain does not join in this effect, and the inference is that the vasodilatation is brought about in other portions of the body. What possible role cerebral vasoconstriction may play in bringing about abnormal electrical patterns in the brain and convulsions is unknown.

Cerebral blood flow, which is normal in both convulsive and nonconvulsive toxemias of pregnancy, was significantly depressed. This was due to the lowering of systemic blood pressure and a slight increase in cerebrovascular tone.

The intravenously administered barbiturates obviously do not correct the pathophysiological condition of the brain present in toxemia of pregnancy. In fact, it is likely that they may cause further deterioration. Because at the present time sedation remains an important aspect of therapy in toxemia, it is important that all sedatives commonly used in this disease be carefully studied in order that one may ascertain which are the least harmful.

SUMMARY

Quantitative studies of cerebral blood flow, cerebral oxygen metabolism, cerebrovascular resistance, arteriovenous oxygen difference, mean arterial blood pressure, respiratory quotient of the brain, and the blood gases were made in 32 toxemic pregnant women before and after administration of amobarbital (amytal®) sodium, thiopental sodium, or phenobarbital sodium. Phenobarbital sodium, given in 7½ grain (0.50 gm.) doses intramuscularly, produced but minimal clinical effect and did not alter any of the cerebral functions studied. Amobarbital sodium and thiopental sodium given intravenously, so as to bring about light anesthesia, produced the following effects: (*a*) highly significant depression of the oxygen utilization by the brain, (*b*) significant lowering of cerebral blood flow, and (*c*) mild depression of mean arterial blood pressure. The elevated cerebrovascular tone that is present in typical cases of toxemia of pregnancy, was not relieved by administration of any of the barbiturates studied.

1930 Chestnut St. (Dr. McCall).

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Acute Otitis Media.—Acute infections of the middle ear continue to be a serious problem in the everyday practice of medicine. Although the widespread use of the various potent antimicrobial agents has greatly modified these inflammatory processes, the incidence of complicating chronic otitis media and middle ear fibrosis has not been decreased correspondingly. It seems probable that, when statistics become available, they will show not only a relative increase in the chronic suppurative processes, but more important, an increase in the resultant progressive deafness. . . . Antimicrobial therapy, which produces a rapid drop in fever and relief of pain together with the marked decrease in immediate serious complications, has resulted in the physician's being lulled into a false sense of security. This complete faith in antimicrobial therapy has led to the neglect of other useful therapeutic measures and has also produced a tendency to carry poorly responding cases into a danger period. Valuable time is lost either by shifting to other antibiotics or by increasing doses, when a well performed myringotomy or simple mastoidectomy would have resulted in prompt clearing of the infection with preservation of hearing.—Thomas Timothy Smith, Acute Otitis Media, *Postgraduate Medicine*, March, 1952.

TOWARD A REGIONAL PROGRAM IN MEDICAL EDUCATION

William J. McGlothlin, Atlanta, Ga.

If someone had predicted in 1947 that five years later the southern states would be transferring over a million dollars across state lines to help support professional schools in medicine, dentistry, veterinary medicine, and social work, he would have been called visionary or, more likely, idiotic, for there was no precedent for transfer of educational funds to anything like that extent. To be sure, West Virginia and Virginia had executed a contract in 1946 under which the Medical College of Virginia agreed to accept 20 third-year medical students upon payment of $1,000 per student per year. That program, though a beginning, was necessarily small. It could hardly foreshadow the organization of the Southern Regional Education Board, under a 14-state compact, which now guides a program affecting 850 students, 19 public and private universities, and 14 states. The board itself brings together educational and political leaders to help institutions plan programs of benefit to the region in ways that transcend state lines.

Why and how did such a startling program develop? Obviously, without fairly strong motivation, a legislature would hardly agree to help support institutions located outside the borders of its state. The legislatures must have felt a strong and compelling need for a program of this sort, for they did so agree. How did that come about? Southern governors had begun talking about the possibility of such a program in 1939-1940, when the Southern Governors' Conference began a series of annual meetings. The governors were impressed by the ever-increasing costs of education. No end to that increase seemed possible; nevertheless, the governors recognized that more, rather than less, education was needed. They saw that the serious problems that grew out of the South's inadequate development of graduate and professional schools in many fields were causing the South to lose its educational investment in many of its most capable young persons. Too often highly competent students had to leave the region to obtain specialized training from graduate and professional schools located in more favored parts of the country. They naturally made professional contacts in the vicinity of the schools they attended and often settled there, contributing their productive years to the newer environment. This kind of loss was sufficiently large to cause alarm, but it was perhaps even more serious that large numbers of capable youngsters never got to graduate or professional schools at all because they were not easily accessible. The area from which any school draws its students is sharply limited. Findings of a 1936 study of student migration make it clear that even so noted an institution as the University of Chicago draws the preponderant majority of its students from within a 250 mile radius.

The problem was, therefore, sharply posed. On the one hand, expansion of graduate and professional schools was necessary to the constant improvement of living in the South. Physicians, engineers, lawyers, social workers, chemists, physicists, and a host of other specialized persons at high levels of training were needed to continue the advances that the South was beginning to make with increasing speed. To supply them, additional funds for education were clearly needed. On the other hand, the economic level of the region was inadequate to support fully developed programs of graduate and professional education in every state, even if that were desirable.

As the governors continued these discussions up to 1945, one possible aid toward the solution of the problem became clear. Some needs could be met by regional action. The states could join forces so that no state would feel required to provide within its borders all kinds of educational programs in order to meet the needs of its students. One or more medical schools might eventually be needed in every state because of the health needs and student demands in that field, but it was clearly not necessary in certain other schools, such as forestry, where six schools could easily serve the requirements of the region. What the governors hoped to find were ways in which joint planning could satisfy regional needs with a minimum of waste. The objective would be to locate, somewhere in the region, facilities in accordance with the need—no more, no less. If this end could be achieved, the South's students would find close at hand opportunities for development of their innate capacities. The loss of capable youngsters could be reduced, and the balance sheet of trained leadership available to the region could begin to be written in black rather than in red.

These were not new ideas to educational thought. Educators had been talking about regional planning in education for a number of years. In the early thirties many had proposed regional planning as one means of more effective expenditure of funds in higher education. They believed that the size of the area a school can serve effectively is in inverse relation to the extent of demand and need for the opportunities that school provides; for example, universal free education means that virtually every child reaching the age of 6 attends an elementary school of some sort. The demand and need is, therefore, high, and the numbers of students involved are great. As a result, each school can serve only a small area. On the other hand, highly specialized work in Egyptology might be needed at only one graduate school in the United States in order to satisfy national demand and need. In between are demands and needs that can be most efficiently met by counties, states, or regions. If this theory is valid, and educational experience seems to support it, it has a corollary that a school should be able to

Consultant for Professional Pr tion Board.

Read before the Forty-Ei ti and Licensure, Chicago, F draw support from the area for which it meets needs and demands, or that different parts of the area should exchange services for the area as a whole. This sounds rather complex; actually, it merely means that either both State A and State B should help support Institution no. 1, which serves both states, even though located in State A; or that State A, through its Institution no. 1, would exchange services with State B, through its Institution no. 2. By limiting what it attempts to provide, each state would be able to use its educational funds effectively.

The governors were thinking of joint support when they adopted at Asheville, N. C., in the fall of 1947, a resolution agreeing that it was the intent of the conference to provide adequate facilities for higher education for both white and Negro students either within or without the borders of the state in which they resided. They followed this action by signing a compact at Wakulla Springs, Fla., on Feb. 8, 1948, under which the regional education program was to become established upon approval by the legislatures of at least six states. Fourteen legislatures have since approved the compact, establishing a region for educational planning that stretches from Maryland to Texas and from Kentucky to Florida. The compact established the Southern Regional Education Board, composed of the governor and three appointees from each of the states, to develop and direct the program.

The governors' actions were imbued with urgency owing to the impending loss of one of the region's medical schools—Meharry Medical College at Nashville, Tenn. Meharry had had a distinguished history since it was organized in 1876 as Meharry Medical Department of Central Tennessee College. It had graduated its first class in 1887 and had obtained a new charter as an independent medical school in 1915. From its beginning it had been devoted to the training of Negro students and was one of the two medical schools in the United States devoted to this end. A major part of its support in recent years had come from philanthropic foundations. These foundations had informed the institution that they could not continue their grants without assurance that other means of continuing support could be obtained. The trustees of Meharry Medical College, faced with this crisis, had proposed that the institution be taken over by the southern states and operated as a jointly supported and jointly operated institution. Quick action was necessary.

It was fortunate that the crisis at Meharry gave an immediate motivation for action by the southern states, but it was unfortunate that the prominence of Meharry in the early press stories gave the impression that the regional education program was devoted solely to problems of professional education for Negroes. Actually, at no time was the purpose of the program limited to education of Negroes. Because of this misconception, however, some supported the program in the expectation that it would continue the separation of white and Negro students in graduate and professional schools. Because of the same misconception, many violently denounced the program for fear that in some way it would, as they put it, "extend and perpetuate segregation" in graduate and professional education.

We know now that both groups—the supporters who hoped the program would maintain segregation and the opponents who were afraid it would—were wrong. Nine of the member states have admitted Negroes to one or more of their publicly supported professional schools since the regional program has been established. Two states, Kentucky and Texas, came into the compact after their universities had admitted Negroes. If the purpose of the program had been to extend and perpetuate segregation in graduate and professional schools, it has been remarkably unsuccessful. At least nine states should have withdrawn from membership. None has. Actually, although it has taken a long time to prove it, the board has operated on a policy that is neither for nor against segregation. It believes that the institutions are responsible for their own admission policies, over which the Southern Regional Education Board should have neither influence nor control. Any other position on the part of the board would constitute an invasion of an institution's rights and would properly be resented.

A month after the governors signed the compact, educators and governors met at Gainesville, Fla., and took the first steps toward putting the program in operation. They established and incorporated a Regional Council for Education to undertake initial studies prior to the time legislatures could act on the compact. A staff was organized and set to work by September of 1948, and proposals for a specific program in medicine, dentistry, and veterinary medicine were readied for the legislatures to act on in the spring of 1949, when they would also consider the compact. The legislatures did approve the compact and appropriated funds for the operation of the program. The Regional Council was, therefore, discontinued and the Southern Regional Education Board formed in June of 1949. The first students under the program entered the schools in the fall of that year.

That was the "Why." How does the program operate? Essentially, its operation was based on the fairly simple idea of extending the area from which a particular school receives its support; for example, Florida does not have a medical school. Its students were having difficulty in obtaining admissions to medical schools outside the state. Florida agreed, therefore, to pay to schools under contracts $1,500 per student per year for Florida students accepted up to a specific quota. The board's staff negotiated contracts with five institutions, Duke University, Emory University, Vanderbilt University, Meharry Medical College, and Tulane University, to accept Florida students who had been certified as legal residents by the state itself. Florida established a certification committee composed of one representative of each accredited school in the state. This committee reviews the records of the Florida applicants for medical school, excludes on academic grounds only those who are obviously not qualified to meet the requirements of the medical schools, checks the legal residence of each student, and sends a list of certified students, through the board, to each of the institutions with which a contract has been made. The student then applies directly to those institutions in which he is interested. The school makes selections in accordance with its own standards and notifies the students. If admitted to a public institution, the student does not have to pay out-of-state fees.

After enrollments are completed, the schools send invoices to the board that list the names of each student enrolled under the contract. The board approves the invoices and forwards them to the states, which, in turn, pay the required amounts to the board. The board then distributes the money to appropriate institutions. In other words, as you can see, the board acts as a clearinghouse, transferring information and funds as required. The program acts as a means of broadening the base of support for the contracting schools.

The contracts were executed between the states and the board, on the one hand, and between the institutions and the board, on the other. Because of this arrangement, a state needed to make only one contract and an institution only one contract. The contracts established the quotas for each state and institution, set the amount of payment, and stated the minimum payment required: three fourths of the total amount under the quota. The contracts are automatically renewable, unless two years' notice is given, but they are contingent on the appropriations of the state legislatures, since without money the contracts would not be very effective. Except at Meharry, the contracts applied first to a single year of the medical school. For Florida, with no medical school, the quotas have been stated in terms of the number of new admissions for the first-year class. For Mississippi, with a two-year medical school, the contracts have applied first to the third year of medical training. The financial crisis at Meharry was of such intensity that the states agreed to make the contract apply to all four years immediately, so that the money available could be large enough to be of substantial help at once.

TABLE 1.—*Number of Medical Students Enrolled Under Regional Program*

Institution	1949-50	1950-51	1951-52 *
Duke University	6	11	17
Emory University	19	39	58
Louisiana State University	4	9	8
Medical College of Alabama	..	4	4
Meharry Medical College	97	101	144
Tulane University	11	28	43
University of Tennessee	10	31	37
Vanderbilt University	4	9	15
Total	151	232	326

* Number of students estimated from budget for 1951-52.

A number of specific benefits have developed from the contracts. The number of students and, correspondingly, the amount of funds have steadily increased as the classes moved through their appointed terms. The funds and the number of students involved for each of the three years in which the program has been operating in medical training are given in the tables. It can be seen that the program has been large enough to provide substantial support for several institutions, including Meharry Medical College, Emory University, Tulane University, and the University of Tennessee, and has provided smaller amounts for Duke University, Vanderbilt University, and the University of Alabama. The funds have made it possible to continue Meharry and to raise the quality of its program, while the funds for Emory, Tulane, and the University of Tennessee have helped meet their increasing costs. Some modifications in admissions have also occurred. Meharry Medical College has given preference to students from the southern states. Meharry officials feared the effects of such a change, but they have been pleasantly surprised at the quality of student. Possibly, better-qualified candidates have been encouraged to apply by the establishment of a quota of students from a particular state. Emory has been able to avoid retrenchment in its instructional program. At Tulane the quality of student from Florida has increased since the contract was established to the point that Tulane now admits almost double the number of students in the Florida quota.

TABLE 2.—*Money Received by Institutions for Medical Education Under Regional Program*

Institution	1949-50	1950-51	1951-52 *	Total
Duke University	$ 9,000	$ 16,500	$ 25,500	$ 51,000
Emory University	28,500	58,500	87,000	174,000
Louisiana State University	6,000	13,500	12,000	31,500
Medical College of Alabama	......	6,000	6,000	12,000
Meharry Medical College	143,250	151,500	216,000	510,750
Tulane University	16,500	42,000	64,500	123,000
University of Tennessee	30,500	69,000	62,000	161,500
Vanderbilt University	6,000	13,500	22,500	42,000
Total	239,750	370,500	495,500	1,105,750

* Figures taken from 1951-52 budget.

States have also received substantial benefits from the program. They have been able to assure places for their students who are qualified for admission. Mississippi, which is conducting a two-year medical school, decided to admit two classes each year and thereby double its output. The contracts made it possible for Mississippi to find places for this increased output with no difficulty. Florida's governor has been so pleased with the arrangement that he stated at the board meeting in Charleston, S. C., in 1950: "This is the greatest bargain since manna fell on the children of Israel." The program may not be quite such a miracle as the governor's statement suggests,

TABLE 3.—*Money Paid by States for Medical Education Under Regional Program*

State	1949-50	1950-51	1951-52 *	Totals
Alabama	$ 15,000	$ 15,000	$ 22,500	$ 52,500
Florida	76,500	130,500	193,500	400,500
Georgia	16,500	16,500	21,000	54,000
Louisiana	6,000	12,000	15,000	33,000
Maryland	9,000	10,500	10,500	30,000
Mississippi	54,500	117,000	120,500	292,000
North Carolina	18,000	18,000	19,500	55,500
South Carolina	5,250	9,000	15,000	29,250
Tennessee	18,000	18,000	28,500	64,500
Texas	......	......	24,000	24,000
Virginia	21,000	24,000	25,500	70,500
Total	239,750	370,500	495,500	1,105,750

* Figures taken from 1951-52 budget.

but many requirements of Florida students for medical training have been met. A by-product value mentioned by both Mississippi and Florida is the student's belief that his state wants him to practice there since it has assumed an obligation for his instruction. The program has not been, and in my opinion should not become, a complete substitute for the medical school requirements of a particular state. The Mississippi legislature and the University of Mississippi are proceeding to establish a four-year medical school at Jackson, because they can demonstrate the school is needed both to provide training for third and fourth year students and to become the capstone of a statewide program in medical care. When this school is completed, Mississippi will need to use the regional program only to supplement its own facilities, not to serve as a substitute for them. Much the same is true in Florida, except that the situation there is not yet clear. As I understand it, the legislature has appropriated some funds for planning a medical school at the University of Florida at Gainesville but has more recently passed another bill, under which the state would pay to the first accredited medical school in Florida the sum of $3,000 per year per Florida student. Eventually, however, Florida will probably build a medical school.

When Florida and Mississippi establish four-year medical schools, every state of the compact area will have within its borders at least one medical school. Every state except Kentucky will have a state-supported medical school. Virginia and Texas will have two state-supported schools. The region, with about a fourth of the nation's population, will have 24, or just about a third, of the four-year medical schools in the nation. The contracts for medical education will probably be substantially reduced as Mississippi and Florida develop four-year medical schools. As that occurs those states will have less reason for helping to support institutions elsewhere. When each state needs and develops a particular educational program there obviously is less need to work out interstate arrangements of any sort.

In what directions then does the future of the program lie? It is clear that there will not be further expansion of the contracts for medical training unless student demand expands suddenly. If that occurs, some states may desire to supplement their own facilities with contracts to add places to the ones already available to their students. A state may meet a portion of its student demand through its own medical school but contract through the board with schools in other states to meet the remainder of the demand that could not be satisfied within the state. Texas now has a quota of students at Meharry Medical College serving to supplement the number of students trained in its own medical schools.

In a field such as public health, student demand and society's need are not great enough to require a school of public health in every state. At present the South is blessed with three public health schools: at Johns Hopkins, the University of North Carolina, and Tulane. These schools may be sufficient to meet the requirements of all the states. Each is suffering from lack of adequate support, and the principle of contract funds, based on a broader area of support, may be a solution to the problem. This possibility will be explored during the spring months. If the situation appears promising, a plan will be presented to the legislature for approval in 1953. Another possibility not yet explored is cooperative effort among medical schools based on the method of exchange of services rather than contracts. The various schools will consider planning research and advanced specializations in line with what is needed in the region. Already forestry schools have taken a look at possibilities in their field. If successful among medical schools, regional planning could create strong offerings in research and specialized phases of the medical field at different points throughout the region, so that the needs of students can be effectively met. Possibilities are limited here only by the imagination and ingenuity of the institutions.

Beyond the medical field the possibilities of regional cooperation in higher education are broad. It appears likely that contracts for services will be a permanent feature of the dental, veterinary, medical, and social work training in the region, because it is highly unlikely that every state in the region will establish schools in these fields. The method of exchange of services has particular applicability to graduate work in the more academic fields, and the board is now exploring the possibilities in such areas as aeronautics, oceanography, political science, statistics, chemistry, pulp and paper, and forestry. In each of these fields, colleges and universities will meet with each other and with representatives of the public and government agencies to work out ways by which each interested institution can provide that part of a total program that it can do best. They will also try to work out new methods of financial support calling upon industry, government, philanthropic foundations, and private donors to contribute to regional programs whose objectives are set by regional and national needs and whose method of cooperation assures the most effective expenditure of funds. This kind of development, the board believes, will help to make higher education a constantly more powerful instrument by which the South may be able to achieve the rich and vigorous life for which its resources and people form the potential.

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Antibiotic Therapy.—In attempts to eliminate one pathogenic strain, major changes in the total bacterial flora of the body may occur which have unforeseen results. For instance, when one administers full doses of penicillin or aureomycin or both to eliminate pneumococci or streptococci from some part of the body, these microörganisms may disappear, but an astonishing increase in other organisms which are not sensitive to these agents may occur. Pseudomonas aeruginosa may arise in sufficient numbers to cause very troublesome infections of the urinary tract, meninges, or lungs. E. coli or enterococci may disappear from the urinary tract, but B. proteus or Ps. aeruginosa may take their place, causing an even more persistent infection. Candida albicans may flourish and may cause very persistent infections about the anus, vagina, or oral cavity as the microörganisms sensitive to aureomycin disappear.—P. S. Rhoads, M.D., The Antibiotics—Uses and Abuses, *GP*, February, 1952.

ESTATE PLANNING FOR PHYSICIANS

PART 2: FUNDAMENTALS, THE YOUNG PHYSICIAN'S FIRST PLAN

W. S. McClanahan, Chicago

This is the second of a series of articles being developed for physicians who are interested in problems relating to economic security in their business and home activities. Other articles on estate planning and insurance will be published in THE JOURNAL *soon.*—ED.

In the first article of this series,[1] we defined estate planning, pointed out the economic changes in recent years that have made it essential to a successful and happy financial life, and examined the physician's special need for professional advice in formulating his financial and estate plans. A logical question here might be, "What are the first steps in estate planning?"

This question can best be answered by looking at the situation of the young professional man, as he starts full-time work in his chosen field. It has been stated that the average physician will be about 28 years of age, with 9 or 10 years of costly education and training behind him, as he enters practice.[2] Let us assume further that he entered practice owing a modest debt to his family for part of his education and office equipment, that he has set up his own practice, and that he is already married. It is obvious that his first needs would be food, shelter, clothing, and the other necessities for himself and his wife. He also must have enough income or funds from other sources to pay his office expenses and maintain his automobile during those difficult months while his patient list is building.

For a time it is going to require close figuring to keep these expenditures within his limited income. If one asked him what plans he had made for the future, he might properly say that he has no time for such luxuries, that he is too busy trying to build up his practice and "to make both ends meet." Yet even in this early stage he has probably started to plan, albeit unconsciously. He may have a small sum put away in his first bank account ("for an emergency"), and he may have his first life insurance policy ("so that my wife would have a little something, if anything happens to me").

FUNDS FOR EMERGENCIES

The young man has already started to plan; he has taken the first steps to insure against two of the hazards that are common to everyone and concern us at every age level—emergencies and premature death. In most family plans a reserve fund to meet emergencies has a high priority and is the first fund set aside from earnings. There have been many articles and whole books written on financial plans for families; each has its own recommended level for emergency reserve funds, ranging from one month's earnings to enough to maintain the family six months on a reduced scale. Each person should analyze his particular situation, preferably in a family conference, decide what his requirements are, and then build his fund up to that level as rapidly as he can and keep it there.

This should not be considered as a vacation fund or a new car fund to be depleted and rebuilt every year or two. It should remain inviolate for the real emergency that may strike without warning. A portion of it should certainly be in cash or a bank account. The balance of it might be in short term bonds or some other form of investment that is readily convertible to cash. The principal requisite of an emergency fund is that it should always be there and should be in cash, or its equivalent, if it is to serve its real purpose.

Having set his personal requirements and created his emergency fund, is the young physician's planning for this hazard completed? No, this fund will have to grow with him. As the years go by there will be many changes that will affect his needs. Earnings will increase, living standards will change, children will be born, and other events will affect family planning. Requirements should be reviewed periodically and the emergency fund should be increased or decreased as conditions change. It is well to state here the first fundamental: Estate planning is not static—it is a continuing activity that ends only when the estate owner and his dependents are gone from the scene.

LIFE INSURANCE

Now let us go back and consider the young physician's provision against that second hazard, premature death. It was stated that he may have his first life insurance policy. Most young men will have acquired at least one policy before they leave school. Often it is purchased and the premiums are paid by a parent until the young man gets started in his profession. It may be rather small, and at best it probably would not begin to compensate the parent for the cost of the young man's education, but it is a start. Let us assume that the young physician has a $5,000 ordinary life insurance policy, purchased by his father and naming the father as beneficiary while he was in school. As the physician entered practice, his father gave the policy to him, he changed the beneficiary to his wife, and assumed the payment of premiums. Does he have enough insurance? Certainly not! How much should he have? This is a question that cannot be answered in the abstract. The needs of each family group are determined by its own aims, desires, hopes, plans, and ability to pay.

Dr. B. L. Riese, addressing a recent graduating class of Northwestern University School of Medicine, told the young physicians that his classmates range in age from 66 to 75 years, that 67% continue in active practice, 7% are disabled, and less than 30% have been able to retire. "If we may make a suggestion," he said, "to the young men now starting out in practice, a suggestion born of long and bitter experience, it would be to buy all the life insurance they can afford to carry, in a sound com-

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[1] McClanahan, W. S.: Estate Planning for Physicians: The Business Side of the Physicians' Life, J. A. M. A. **148**: 1401 (April 19) 1952.

[2] Dickinson, F. G.: Income Tax Discrimination Against the Professions, J. A. M. A. **142**: 1357 (April 29) 1950.

pany, and out of their surplus to buy bonds and stocks of basic industries, leaving the gold mines to the gamblers."[3]

It should be noted that about 40% of the active physicians in the United States had military service in World War II, and many have retained their National Service Life Insurance. This group has an advantage over others in that they may have up to $10,000 of this insurance on a very low cost basis. Originally this was term insurance, with restricted beneficiary provisions and rigid settlement terms. Amendments to the laws since the war have made it possible to convert this insurance to one of several permanent plans and have liberalized the settlement options available. The physician who has this insurance should consult his life underwriter as to whether to convert to a permanent plan and what settlement option to select. Of course the choice of an option depends on many personal factors, but it should be noted that option 4 (the refund annuity option) is unusually desirable in this insurance. Congress was so liberal in setting the rates that a $10,000 policy settled under this option is about equal to $12,500 in a private insurance company. Regardless of whether this insurance is still on a term basis or converted to a permanent plan, the physician should, by all means, retain it; it is good insurance and can be fitted in well with his estate plan and a sound insurance program.

That brings us to another of the fundamentals of estate planning—particularly for professional men: Life insurance is the foundation of most successful estate plans today. About 86 million Americans now own over 250 billion dollars worth of life insurance in companies with assets totalling over 68 billion dollars. This is a high tribute to the confidence reposed in the institution of life insurance by the average American. For persons whose lifetime accumulations of property will come to them solely in the form of taxable income (salaries, fees, and commissions), life insurance is almost the only sure way to create or build a satisfactory estate. As was pointed out in the previous article, high income taxes, decreasing purchasing power of the dollar, and declining interest rates have taken their toll. The old pattern of saving a portion of earnings, investing it, and reinvesting the income as received will seldom create an estate that is sufficient for all purposes at all times. This may work out well in later life, when the children are grown and family responsibilities are lessened, and when earnings may exceed current needs. But the young physician looks forward to long years of heavy and increasing responsibilities, and his current income provides only for current needs and leaves no excess for an investment program.

Something else is needed, and that something else is life insurance. It is the only asset that multiplies in value immediately at death. It is the only method by which the young man can make sure that his primary plans can be carried out, even if death intervenes long before he has a chance to complete his other plans. For his long range plans (retirement), life insurance and its close associate, annuities, can furnish the retirement income to the physician which Social Security and private pension plans furnish to the business employee.[4]

So the young physician's second step in estate planning should be to enter into a program of purchasing life insurance that will build an adequate insurance estate. The details of how to formulate such a program, what types of insurance it will include, and the dates and amounts of purchases are beyond the scope of this article. The field of modern life underwriting is so broad, the purposes which insurance can serve are so diversified, and the types of policies available are so varied that whole books are written on one phase of the subject. All I can do here is to suggest some general principles of creating an insurance estate as part of an over-all estate plan.

THE LIFE INSURANCE UNDERWRITER

It is at this point that the young physician should, and probably will, first become acquainted with a member of the "estate planning team" mentioned in the previous article. This is the life insurance representative or agent, who is now more commonly referred to in the estate planning field as the "life underwriter" or simply "underwriter." He is an important member of this team and is a good man to know.

Naturally not all life underwriters are equally trained and experienced as insurance technicians, just as they do not possess the same personal traits that mark the sincere and friendly insurance counsellor. Great progress has been made in the past 25 years, however, in the joint efforts of the insurance companies and the underwriters to raise the standards in the insurance sales field.[5] An outstanding example is the growth of the American College of Life Underwriters and its program of education and on the job training, leading to the certificate of Chartered Life Underwriter (known in the estate planning field as C. L. U.).[6] This is coming to be recognized as a professional designation in the insurance field, and may at some future date achieve a standing equal to that of C. P. A. in the accounting field. In addition to this program, many insurance companies have emphasized college education as a prerequisite to joining their sales force, and they engage in extensive programs of home office and branch training before the new man commences actual sales work. Although the number of C. L. U.'s is not large compared to the total insurance sales force today, the trend indicates that in a generation or two a sizeable proportion of the competent underwriters may have earned this professional designation.[7] It is well to remember, however, that life insurance selling is, by its nature, a "soliciting" business and should remain so. Only as the life insurance underwriters continue active solicitation of new business will the American family continue its preeminent position as the best insured and protected family group on earth.

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[3] Time and Money, Boston, The Cambridge Associates, 1952.

[4] It was noted in the previous article that these two forms of retirement income may provide up to $300 per month for the business employee.

[5] One of the principal reasons for the wide acceptance of life insurance in America has been the work of a trained, full-time sales force. In America insurance is "sold." In many other countries insurance is "bought"; that is, the buyer must take the initiative. As a result America, with only 7% of the world's population, owns 75% of the world's life insurance. The insurance salesman can take pride in having helped to make America life insurance conscious.

[6] The C. L. U. must qualify under standards of character, knowledge, and experience. The course includes studies in economics, government, sociology, law of insurance, wills, trusts and estates, taxation, banking and credit, corporation finance, and investments. He must pass a series of five comprehensive, written examinations. Over 200 colleges and universities now cooperate in offering these studies and supervising these examinations.

[7] Over 4,500 persons have completed the course of training and have received the certificate of C. L. U. since the founding of the college in 1927, and 5,500 others are now taking the examinations. While this is a small segment of the persons engaged in insurance sales, the trend toward professional training is significant (Gregg, Davis W.: Twenty-Five Years of C.L.U., J. Am. Soc. Chartered Life Underwriters 6:50 [Dec.] 1951).

The young physician should align himself with a life underwriter early in his practice. It is not difficult to locate and identify a good life underwriter. There are men in every community who have built a solid reputation for technical insurance knowledge, skillful analysis of family needs, honest advice as to what insurance best meets those needs and sincere interest in the financial welfare of their policyholders. These men enjoy a respected place in the business community. Inquiry by the young physician among his older colleagues, his business associates, the bankers, trust officers, and attorneys of the community will place him in touch with the type of life underwriter who can and will become a trusted insurance counsellor.

Having placed himself in the hands of a competent life underwriter, the physician should give him his confidence and his insurance business. Shopping around for bargains or passing his insurance business around on a basis of personal friendships will not build a sound, integrated insurance program. He should disclose to his life underwriter all pertinent facts about his family and financial status, as he would to his banker or attorney. He should seek and accept the advice of this underwriter as to a long range program for acquiring an insurance estate, as to the specific types of policies needed to carry this out and the time when purchases and changes should be put into effect. One of the requisites of a good insurance program is the periodic review of the entire plan by the policyholder and life underwriter and the prompt revision of any part of it to meet changed conditions.

An essential element of a sound insurance program is that it is tailored to meet the specific needs of the individual policyholder. There is no such thing as "the correct plan" for a certain age group, to the exclusion of all other plans. Yet there are certain general principles that all life underwriters follow in constructing an individual plan. As stated above, the young physician will find that his need for insurance protection will be greatest when his funds available to buy it are least adequate. If funds for premium payment were unlimited, it would be simple to lay out a plan for $100,000 or more of permanent protection for the young physician and his family from the day he starts practice. Since realities must be faced, the young man's program is always going to include several compromises. His long range plan will call for purchase of various types of permanent policies, which include both the protection and the investment features. His immediate need is for the most protection he can get for the least cost. Thus the life underwriter may recommend that his first purchases be 5 or 10 year term insurance, which includes no investment features and is convertible to permanent insurance without physical examination. Also frequently recommended is a contract known as a family income policy, which includes elements of both term and permanent insurance. Since term life insurance is expensive if continued longer than necessary, it should be converted to permanent insurance as soon as feasible. If the young physician will take the time to let his life underwriter explain the basic features of the various contracts, and will study them seriously, he can purchase his first insurance intelligently, and thus get the most value for his premium dollars. He will have made a good start on the most important part of his estate plan.

MAKING A WILL

Having made a start on these first two phases of his estate plan, an emergency fund and an insurance program, the young physician should proceed at once to the third phase; he should make a will. This cannot be overemphasized; it is of paramount importance. It is often said in estate planning that a will is the most important document a man will ever sign, unless it is his application for a marriage license. This may sound facetious, but it is literally true. There is no other way in which a person can be sure that his estate, however small, will be distributed according to his wishes at his death. I have not the space here to go into the many compelling reasons why every physician should have a will, or the pitfalls encountered when he dies without a will. These were so ably set out by Judge Waugh (of "the world's busiest court") in The Journal,[8] that it would be worth while for every physician to read this article again.

It is at this stage of his planning that the young physician will probably become acquainted with the second member of the estate planning team—the lawyer. It might be well to state here the third fundamental of estate planning: Everyone should have a will. Its corollary is the fourth fundamental: Only a lawyer should prepare a will. If the physician lives in a larger community where the banks and trust companies are engaged in estate planning, at this time he may also become acquainted with the third member of the team, the trust officer, who will work with the lawyer in plainning the estate and its future management.

In my experience in assisting with the estate plans of persons of all ages, the commonest objections to making a will raised by the young man are: "my estate is too small," "my estate is very simple—it all goes to my wife," or "my property is all in joint tenancy—I don't need a will." Let us take a few moments to analyze these statements.

"My estate is too small." I have become very skeptical of this statement. Many times a customer has made this statement in the utmost sincerity, and we have then proceeded to list and analyze his assets. Perhaps it turned out that he had only a small bank account, a few savings bonds, some household furniture, an automobile, and a few small life insurance policies. Did he have an estate and need a will? Certainly! It does not take much imagination, in these days of high prices, to translate those few ordinary items into a value of several thousand dollars. One large trust institution embarked on a public education program a few years ago, the theme of which was, "If you have $1,000 you have an estate." This highlights the fact that often the small estate needs the added protection that a well drawn will provides more than the large estate. The small estate simply cannot afford the shrinkage and avoidable loss occasioned by the lack of a will. Or if the husband and wife die together, the proceeds of those few small insurance policies may be distributed in a way contrary to the wishes of the insured, unless he has a will. Size of the estate alone does not determine the need for a will. If a person has any property at all and a normal human desire to pass it on to some favored person or group at his death, he needs a will.

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[8] Waugh, W. F.: Wills for Physicians, J. A. M. A. 144: 842 (Nov. 4) 1950.

"My estate is very simple—it all goes to my wife." If this were literally true, in some situations it might be satisfactory to let the law distribute one's property. It is surprising how many men assume this to be the fact. No state has laws giving all a man's property to his wife in every situation. Most states provide a larger share for the children (even during infancy) than for the wife. Allowing fractional shares of property to descend by law to minor children may make it very difficult for the wife to use the property promptly for the best interests of the children and herself.[9] In many states some types of property (such as real estate) must be shared by the wife with her husband's brothers, sisters, and parents, if there are no children. No, the simplicity of the estate, or the mistaken idea of the estate owner as to who will get it at his death, will not lessen the trouble, expense, and frustration caused by failure to make a will.

"My property is all in joint tenancy—I don't need a will." This is even a commoner sedative to lull the property owner into a false sense of security. It is true that joint tenancy (in those states which recognize it), and tenancy by the entirety (in other states), are valuable methods of owning property in many situations. Lawyers and trust officers often recommend it when all facts are known. It is a simple and inexpensive method of passing title to certain assets, such as the family home, to the wife. But it is essentially a legal device, hedged about with many technical restrictions, and it can incur extra taxes in some situations.[10] A pamphlet published by the Illinois State Bar Association [11] asked the question, "Is joint tenancy a substitute for a will?" The answer given was, "It is in about the same sense that a size 34 suit will fit a man; it will fit some men but not others." In some cases it may defeat the wishes of the estate owner, in some cases it will add considerably to the tax burden of the surviving joint tenant, and it is not a certain device to avoid all death taxes and probate expense. The principal thing that the young physician should remember, as he acquires a bank account, a home, and securities, is that he should take title in joint tenancy only on the advice of his lawyer, after a full disclosure of all the facts.

There are many other reasons given by young men for not having made a will. None of them should be allowed to defer this all important duty. The young physician should not feel self-conscious about going to his lawyer for his first will. Many a man twice his age has sat at my desk and apologetically said, "I just never got around to making a will, but last month my best friend died and left his affairs in a terrible mess, so I decided to make a will right now." In many countries property owners have no choice, or very limited rights, to say who shall get their property at their death. It is a tragedy that in America, where we have the most liberal of laws and the broadest privilege to choose who shall benefit from our property after we are gone, so many people neglect this valuable privilege.[12]

The young physician will find that having his lawyer prepare his will is not a burdensome or time consuming task. When it is done, he will experience a deep sense of satisfaction in knowing that his estate, however small, will be distributed under his will to his dependents and loved ones, according to his own individual plan.

PURCHASING A HOME

Perhaps one more phase of the young physician's estate plan should be mentioned, the purchase of a home. Most persons consider this a major transaction and one of their most valuable assets, although they may not consider it as an investment. This is such a local problem that no specific suggestions of value could be made in an article of this type. Every detail of the transaction will be governed by family status, individual taste, financial ability, size of community, state laws, and local real estate practices. In the smaller communities the physician may buy or build his home before he enters practice. In the larger urban centers he may rent an apartment or house for several years before buying a home of his own.

Twenty years ago there were some "rules-of-thumb" in the real estate business regarding the relation between a person's annual income and the amount he should invest in a home. These varied considerably between different localities and different sized communities. Taking Chicago as an example of a large urban center, it was said that a young man should not pay more than two or three times his annual income for a home. Changes in personal income taxes, in the purchasing power of the dollar, and in methods of home financing (such as the advent of the long-term, monthly payment, F. H. A. insured loan) have played havoc with such rules. Today we are more likely to compare the home buyer's annual income to his "total occupancy costs" for the home, including interest and principal payments on the mortgage, insurance, taxes, heating, repairs, and maintenance. Taking Chicago as an example again, the banks and other lending agencies are likely to advise the young man not to commit himself to pay more than 20% of his annual income for these occupancy costs of his home. The young physician would be wise to consult his local banker about such considerations in his own community before purchasing a home.

A home is a sound investment, but not from the standpoint of income or capital appreciation. Its value lies more in the fact that it brings to the owner a sense of pride, personal satisfaction, family solidarity and belonging to the community. It should be bought whenever the physician's family status makes it desirable and his financial status makes it feasible. A word of caution should be added here: Seek competent advice before taking even the first steps to purchase a home. Real estate is in a class by itself. From the first signature on a contract to purchase to the final approval of title by a lawyer, it is fraught with special risks to the layman. The local realtor should be consulted as to questions of construction, location, neighborhood trends, appraisals, and value. The local banker should be consulted on methods of payment and financing. Above all the lawyer should be consulted, early in the transaction, as to questions of contracts, deeds, surveys, mortgages, and either an abstract or title guarantee policy.[13] He should act as the coordinator of the entire transaction. A real estate purchase completed without legal advice can be the source of trouble and litigation in future years. The usual fee of the lawyer is a small premium to pay for the assurance that your title is "free and clear of all encumbrances."

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[9] Local laws of descent of property are the determinants in this situation. In Illinois the wife would inherit one-third and the children two-thirds of the property. A guardianship for the minors would add to the cost of administration and might delay a necessary sale to the detriment of the estate. The physician should consult his attorney about the laws of his state relating to these matters.

[10] A further discussion of some of the disadvantages of joint tenancy will be contained in a subsequent article.

[11] Wills—Their Importance and Why You Should Have One, Springfield, Ill., Illinois State Bar Association, 1947.

[12] Judge Waugh [8] states that in one large metropolitan area 60% of the estates going through the probate court are administered without a will.

There is one more suggestion worthy of consideration by the young physician purchasing his first home, and that is to purchase so-called "mortgage insurance," which will provide the cash to pay the mortgage in the event of his death. Although permanent insurance may be used for this purpose, decreasing term insurance, in which the death benefit is reduced as the mortgage is paid off, is frequently recommended. Many a young widow has been forced to sell her home because she could not keep up the mortgage payments from her limited income after her husband's death. This protection assures her of a home for herself and the children, free of debt. Here again the life underwriter should be consulted to work out the details of such a program.

There are many other transactions that the young physician may enter into in his first years of practice that might be considered as part of his estate plan. There is not space to mention them here. If the young physician has created an adequate emergency fund; has embarked upon a sound insurance program with the advice of his life underwriter; has executed a well-drawn will with the advice of his lawyer; and, perhaps, has purchased a satisfactory home with the advice of realtor, banker and lawyer, he will have made an excellent start on a sound estate plan that should lead to a successful business career. He will have avoided the costly mistakes of many business and professional men that we in the estate planning field are often asked to correct in later years.

605 N. Michigan Ave.

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[13] These same suggestions apply with equal force to other real estate transactions, including the sale of one home and purchase of another. The Revenue Act of 1951 made some important changes in the treatment of this latter transaction for income tax purposes.

Unnecessary Estrogen Therapy.—Fully half of all women who go through the menopause do not require estrogen therapy. It is unfortunate that nearly every woman in the late forties who complains to her physician of vasomotor and nervous disturbances is given estrogen hypodermically or orally. Even many women in their early forties who still bleed regularly but complain of vague but distressing symptoms are given estrogens. It is a serious mistake to give estrogens to women who have not stopped menstruating and even to some who have had a true menopause, i. e., cessation of bleeding. In most cases, estrogens will have to be administered for years if their use is not restricted and limited to the minimum from the start. Many women can be carried through the trying days of the change of life by encouragement and phenobarbital. And if estrogens must be prescribed there is little need to give them hypodermically.—J. P. Greenhill, M.D., 1951 Year Book of Obstetrics & Gynecology, The Year Book Publishers, Inc., Chicago, p. 524.

COUNCIL ON PHARMACY AND CHEMISTRY

The following abstract of recent nomenclature decisions of the Council is authorized for publication.

R. T. Stormont, M.D., *Secretary.*

NEW GENERIC AND BRAND NAMES RECOGNIZED BY THE COUNCIL

The Council collaborates with manufacturers in the selection of generic and brand names for marketed drug preparations presented for acceptance and also for new products still under development or clinical trial. The last report on such names appeared in The Journal, Nov. 3, 1951, page 950.

The following abstract lists the generic designation, the chemical name, where necessary for information, and the brand name or names simultaneously recognized for the stated firms. In general, a generic name should bear recognizable relation to the chemical name and conform as closely as is consistent with brevity and practicality to existing systems of scientific nomenclature. The chief requirement for a brand name is that it should not be therapeutically suggestive.

Alkavervir for a powdered extract of Veratrum viride alkaloids: Veriloid (Riker Laboratories, Inc.)

Benzoquinonium Chloride for the synthetic compound 2,5-bis-(diethylaminopropylamino)benzoquinone bis-benzyl chloride: Mytolon Chloride (Winthrop-Stearns, Inc.)

Calsulfhydryl for the compound aqueous dispersion of sulfur complexes of calcium polysulfides and thiosulfates containing a labile sulfhydryl group: Hydrosulphosol (E. C. Lientz & Co., Inc.)

Chloromethapyrilene Citrate for N,N-Dimethyl-N′-(2-pyridyl)-N′-(5-chloro-2-thenyl)-ethylenediamine citrate: Chlorothen Citrate (Whittier Laboratories)

Cyclocumarol for the compound 3,4-(2-methyl-2-methoxy-4-phenyl)dihydropyranocoumarin: Cumopyran (Abbott Laboratories)

Gallamine Triethiodide for tri-(diethylaminoethoxy)benzene triethyliodide: Flaxedil Triethiodide (Lederle Laboratories Division, American Cyanamid Company)

Iodopanoic Acid for 3-(3-amino-2,4,6-triiodophenyl)-2-ethylpropanoic acid: Telepaque (Winthrop-Stearns, Inc.)

Mercaptoarsenol for 2-acetylamino-4-(methylol-cycloethylene-dimercaptoarsine) phenol: Balarsan (Endo Products, Inc.)

Methamexamine for 2-methylamino-4-methylhexane: Naremide (Sharp & Dohme, Inc.)

Monobenzone for the monobenzyl ether of hydroquinone: Benoquin (Paul B. Elder Co.)

Selenium Sulfide: Selsun Sulfide (Abbott Laboratories)

Sodium Carboxymethylcellulose for that derivative of methylcellulose: Thylose Sodium (Jackson-Mitchell Pharmaceuticals, Inc.)

Streptokinase-Streptodornase for a mixture of these two enzymes: Varidase (Lederle Laboratories Division, American Cyanamid Company)

Sulfisoxazole and Sulfisoxazole Diethanolamine for 3,4-dimethyl-5-sulfanilamido-isoxazole and the diethanolamine salt: Gantrisin and Gantrisin Diethanolamine Hoffmann-LaRoche, Inc.)

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MEMBERSHIP AND FELLOWSHIP IN THE AMERICAN MEDICAL ASSOCIATION

Some physicians are confused concerning their status as members or fellows of the American Medical Association. This confusion has occurred because prior to 1950 all physicians who were active members of their state medical societies automatically became members of the American Medical Association. More than 70,000 of these members by 1949 had applied for fellowship, which entitled them to receive THE JOURNAL or one of the special journals, and to participate in the scientific activities of the American Medical Association. In 1949 a voluntary assessment was levied on the members of the Association, and in 1950 dues were imposed for the first time. A summary of the changes that have occurred in the membership and fellowship structure of the American Medical Association appears in the Organization Section of this issue of THE JOURNAL. This will explain for any physician who is in doubt what is required now for membership in the Association.

Reprints of the statement in the Organization Section will be available in any quantity for medical oganizations and publications. Inquiries should be directed to the Secretary of the Association, Dr. George F. Lull, or to the Director of Records and Circulation, 535 North Dearborn St., Chicago 10.

FOUNDATION'S 1952 CAMPAIGN UNDER WAY

Aiming at a goal of 2 million dollars, the American Medical Education Foundation has launched its 1952 fund-raising campaign. Committees of state and county medical societies have been organized and are at work in almost all states in a concentrated effort that began early in April and will continue until the end of June. The objective of this intensive campaign is to raise as much of the 1952 fund as possible by the end of June so that substantial sums can be made available to the medical schools when they begin their next fiscal year on July 1.

The prospects for this year's fund appear bright. During the first three months of 1952 more individual gifts were received than during the entire year of 1951, even though this year's drive had not officially been initiated.

In establishing the Foundation, the medical profession is pioneering in an effort to find a positive solution to the serious financial problems that beset the nation's medical schools. Already this effort has stimulated new support for the medical schools from lay groups through the National Fund for Medical Education and from the members of the profession itself through newly established alumni funds, local foundations, support at budget hearings before state legislatures, and by other means. A successful campaign this year will add greatly to the real momentum that is being developed for solving the problems of medical education through local and voluntary action.

Physicians are reminded that they may earmark their gifts for a specific school and that the full amount of the gift will be transmitted to the school through the National Fund for Medical Education over and above the school's full share of unearmarked funds raised by the Foundation and the Fund. All expenses of the Foundation's fund-raising effort are being borne separately by the American Medical Association and by the state and county medical societies participating in the drive. Thus the entire amount of all gifts received will be passed on to the medical schools—an unusual feature in fund-raising campaigns.

Physicians who wish to support the Foundation are urged to make their contributions at this time. Contributions should be directed to the officers for the state drive where such drives are being conducted. Where no state campaign is in motion, checks should be sent to the Foundation, 535 North Dearborn Street, Chicago 10.

DIAGNOSIS OF INFECTIOUS MONONUCLEOSIS

The diagnosis of infectious mononucleosis is now made in the presence of a variety of clinical pictures, both acute and chronic. Often the only laboratory confirmation is the finding of atypical lymphocytes in the peripheral blood. Some observers believe that this is not sufficient evidence and that heterophil agglutinins must also be present before a positive diagnosis can be made. Opinion in the literature is divided on this point.

Many investigators have found negative heterophil agglutinin reactions in a significant proportion of patients with symptoms and blood smears characteristic of infectious mononucleosis. Others have found the agglutination reaction positive in every, or almost every, fully developed case of this disease. There are several possible explanations for this discrepancy, two of which are reviewed by Bender in this issue of THE JOURNAL (page 7). In the first place, the incidence of positive reactions in different series of cases varies according to the investigator's definition of positivity. A worker who regards a titer of 1: 16 as the dividing line between normal and abnormal will find more positive reactions than one who regards a titer of 1: 320 as critical. In the second place, the number of positive reactions encountered depends on the time of performance of the tests. As significant titers of agglutinins may not appear until the end of the first week or later and since they may disappear within two weeks, single tests performed before or after these dates may be negative. In the third place, the incidence of positive reactions will vary with the criteria the author uses for the admission of patients to his series. If he accepts as bona fide cases only those in which there are positive heterophil agglutination reactions, the incidence in his series can hardly be less than 100%. If, on the other hand, he bases his diagnosis solely on the presence of atypical lymphocytes, he may include in his series patients who actually do not have infectious mononucleosis, since these cells may occur in other diseases. Finally, the percentage of positive agglutination reactions may depend on technical factors. If the tests are performed on refrigerated serum, false positive results may be obtained owing to the presence of cold agglutinins.[1] These reactions disappear on rewarming the serum to 37.5 C. Moreover, false negative reactions may be obtained if the sheep erythrocytes used are of low agglutinability. Keiper [2] and Zarofonetis and Oster [3] have found that the agglutinability of erythrocytes from different sheep varies widely and that cells from an occasional sheep react only slightly with the serum of known cases of infectious mononucleosis. Lesser variations in agglutinability are encountered in cells drawn periodically from the same sheep, and there is some variation following storage of cells.

It is evident that absolute agglutinin titers obtained with different samples of sheep cells have much less significance than is generally believed. Under these circumstances, only a rise in agglutinin titer during the course of the disease can be regarded as significant and then only if all serum specimens are saved and tested simultaneously against one lot of sheep cells of known agglutinability. Since this technique has seldom been used in studies published to date, reports of borderline positive and negative reactions must be interpreted with caution. Variations in agglutinin titers may also be obtained by varying the concentration of cells used in the test.[1] It is obvious that discrepancies in the results obtained by different workers cannot be eliminated until techniques are standardized and specified in published reports.

In support of the argument that neither atypical lymphocytes nor sheep cell agglutinins alone should be accepted as positive evidence of infectious mononucleosis is the fact that neither of these signs is found exclusively in this disease. Abnormal lymphocytes are occasionally seen in a variety of conditions resembling infectious mononucleosis clinically, including infectious hepatitis, primary atypical pneumonia, German measles, measles, acute brucellosis, allergic rhinitis, asthma, migraine, acute sinusitis, pharyngitis, laryngitis, bronchitis, angina pectoris, and coronary thrombosis. Sheep cell agglutinins also occur in a number of conditions other than infectious mononucleosis.[4] They are found in low titers in serum from normal subjects and in higher but reversible titers in serum containing cold agglutinins. They have also been found following injection of horse serum, and in the serum of patients with infectious hepatitis,[5] primary atypical pneumonia,[6] German measles,[7] scarlet fever,[8] polycythemia, various sarcomas, tuberculosis, monocytic leukemia, Hodgkins disease,[9] and other diseases. It is claimed that the reactions encountered in leukemias are probably due to cold agglutinins.[10]

Attempts to differentiate the hematological and serologic reactions occurring in infectious mononucleosis from those occurring in other diseases have not been entirely successful. While the agglutinin titers and atypical cell counts in infectious mononucleosis are usually higher than those occurring in other diseases, this is not always true, so that no absolute quantitative differentiation is possible. Qualitative differentiation of the atypical lymphocytes is said to be aided by supravital staining,[11] but this approach has not been adopted widely. Qualitative differences in the sheep cell agglutinins occurring in different conditions have been described, but these are apparently not invariable. It is stated [12] that: 1. The agglutinins found in infectious mononucleosis are absorbed by ox cells but not by guinea pig kidney. 2. The agglutinins found in normal serum are absorbed by guinea pig kidney but not by ox cells. 3. The agglutinins occurring after horse serum injections are absorbed by both antigens. These tests have proved useful in the differential diagnosis of many cases of infectious mononucleosis, but they have also yielded a number of inconsistent results. Agglutinins from patients with infectious mononucleosis have given the reaction usually seen in normal serum, while agglutinins from patients with serum sickness have given the reaction supposedly characteristic of infectious mononucleosis.[13] Kaufman [8b] found that the agglutinins of several patients with infectious mononucleosis gave the reactions of serum sickness, and at different times in the course of the disease serum from the same patients gave different qualitative reactions with or without changes in agglutinin titer. Other inconsistencies have been found by Wechsler [14] and Liebowitz.[5c] While these occur in only a small proportion of cases and may be due to differences in technique or in the criteria used for the diagnosis of infectious mononucleosis, they emphasize the fact that qualitative differentiation of various types of heterophil agglutinins is sometimes difficult. In view of the lack of specificity of the laboratory signs of infectious mononucleosis it would seem wise to insist on as many confirmatory tests as possible before making a positive diagnosis. While it is possible that in mild or subclinical cases the stimulation to antibody formation may not be sufficient to produce significant titers of heterophil agglutinins, every effort should be made to detect them in each case by standardized tests performed serially.

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RELIEF OF PAIN

Approximately one-half of patients who come to physicians for medical attention complain of pain or discomfort in one form or another. While most patients are not interested in matters pertaining to the physiology and pathology of their illness, they are seldom indifferent to pain or to procedures necessary for obtaining relief therefrom. Fortunately, physicians can relieve pain. This ability is among the greatest attributes of the medical profession; if it did not exist, the skills required to restore the affected person or organ to normal would have little opportunity to prove effective.

Pain can be considered from several points of view. In one, an organic basis is discovered and treated; in another, the cause is undetected and pain is treated as a symptom; and, in a third, the difficulty is psychogenic. Few patients who have been in pain for long periods of time become inured to pain. The longer pain must be endured, the less well it is tolerated. Kolb [1] points out that patients who are in pain as a result of physical disease usually describe their symptoms precisely, signs of physical disease and suffering are commonly evident, there is a demonstrable limitation of movement consistent with the presence of pain, and analgesics provide a full or partial measure of relief. In contrast, patients' complaints are thought to have a psychogenic basis when there are no signs of physical disease, when pain persists long past the usual period of subsidence of a known acute illness or physical injury, and when pain is precipitated and aggravated by discussion of topics emotionally distressing to patients.

Physicians have available to them a number of well-established procedures for relieving pain. These include mechanical means; the use of heat or water to lessen spasm; either a surgical attack on the source of pain or surgical interruption of pain circuits in the peripheral and central nervous systems; the use of anesthetic agents acting locally in the spinal cord or centrally on cerebral function; psychotherapy; and analgesic drugs. At one time the painful conditions for which roentgen therapy was proposed were numerous. Today, the entities for which roentgen rays are prescribed satisfactorily number perhaps no more than a half dozen.[2] Methods of obtaining relief from pain depend on various factors, i. e., the nature of the pain-producing substance, the experience and ability of the attending physician, the general condition of the patient, the physical and geographical circumstances under which treatment is begun, and the availability of different modes of therapy.[3]

Attention has been directed recently to the use of the diagnostic and therapeutic nerve blocks, the former for the purpose of locating pathways of pain and the latter for interrupting pathways of pain either semipermanently or permanently.[4] Greater use is also being made of prognostic nerve blocks, which give the patient the experience of temporary interruption of nerve sensation before the interruption is made permanent or semipermanent. In general, blocking of sensory nerves can provide pain relief for virtually any part of the body.

Pain is frequently a prominent symptom of cardiac disease and sometimes its only manifestation. Pain, in the presence of cardiac disease, may be due to myocardial ischemia or to pericardial irritation and can occur in association with certain diseases of the aortic arch. In the final analysis, a knowledge of pain patterns is the key to the differential diagnosis of pain in, or referred to, the thoracic region.

According to Hammes, drugs that relieve pain are divided into four classes: those that act on the organ or tissue producing the pain; those that act locally to block the conductivity of pain fibers; the true anesthetics that produce unconsciousness, thereby relieving awareness of pain; and the analgesics, which selectively depress the central appreciation areas without loss of consciousness. The drugs of the first group are most desirable, since they act to restore normal function. The analgesics are the most widely prescribed; however, when used promiscuously they constitute a clear and present therapeutic danger, for such practice encourages lax diagnosis on the part of overly busy physicians. Actually, when the precise reason for pain remains undetermined, prescribing an analgesic should be considered to be but a temporary, humane expedient and not an end in itself. There is little doubt that, when analgesic drugs are employed on a rational basis, physicians will come nearest to fulfilling with credit that phase of medical practice which, at least to the patient and his family, is of prime importance—the relief of pain.

COURSE IN ELECTROCARDIOGRAPHY

A short course in basic electrocardiography will be conducted at the Chicago Headquarters during the week prior to the Annual Meeting of the American Medical Association, which is sponsoring the course. The instructors will be leading electrocardiologists of midwestern and southern universities. The course will emphasize the place of the electrocardiogram in the diagnosis and management of heart disease and the harm that may result from improper interpretation. Any member of the American Medical Association is eligible to attend the series of free lectures. Further information will be found on page 68 of this issue of THE JOURNAL.

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[1] Kolb, L. C.: Pain as a Psychiatric Problem, J. Lancet 72: 50, 1952.

[2] Leddy, E. T.: Analgesic Effect of Roentgen Rays, J. Lancet 72: 55, 1952.

[3] Hammes, E. M., Jr.: Pain Relieving Drugs, J. Lancet 72: 67, 1952.

[4] Pender, J. W., and Lundy, J. S.: Diagnostic and Therapeutic Nerve Blocks, J. Lancet 72: 76, 1952.

ORGANIZATION SECTION

REFERENCE COMMITTEES OF HOUSE OF DELEGATES

The Speaker of the House of Delegates of the American Medical Association has appointed delegates to serve on the reference committees of the House at the Chicago Session as follows:

Sections and Section Work:
Grover C. Penberthy, Chairman, Section on Surgery, General and Abdominal
Paul A. Davis, Section on General Practice
Carl A. Grote, Alabama
Eugene F. Hoffman, California
Herbert L. Bryans, Florida

Rules and Order of Business:
Wyman D. Barrett, Chairman, Michigan
Charles L. Shafer, Pennsylvania
Bernard Klein, Illinois
James Q. Graves, Louisiana
John W. Parsons, Maryland

Reports of Board of Trustees and Secretary:
Charles F. Strosnider, Chairman, North Carolina
Jesse D. Hamer, Arizona
Hoyt B. Woolley, Idaho
Harold F. R. Brown, New York
F. Sanchez Castano, Puerto Rico

Medical Education and Hospitals:
Edgar V. Allen, Chairman, Section on Experimental Medicine and Therapeutics
William R. Brooksher, Arkansas
Charles H. Phifer, Illinois
John J. Masterson, New York
Charles G. Hayden, Massachusetts

Legislation and Public Relations:
E. Vincent Askey, Chairman, California
Hugh H. Hussey, District of Columbia
Fred H. Muller, Illinois
Ralph A. Johnson, Michigan
Warren L. Allee, Missouri

Hygiene and Public Health:
William F. Costello, Chairman, New Jersey
W. Palmer Dearing, Public Health Service
Robert B. Homan Jr., Texas
James P. Hammond, Vermont
Lewis A. Alesen, California

Amendments to Constitution and By-Laws:
Leo F. Schiff, Chairman, New York
Allen T. Stewart, Texas
Joseph F. Londrigan, New Jersey
Robert B. Wood, Tennessee
Roscoe H. Reeve, Wyoming

Reports of Officers:
Julian T. Price, Chairman, South Carolina
Ralph B. Eusden, California
Alfred S. Hartwell, Hawaii
F. S. Crockett, Indiana
George Braunlich, Iowa

Credentials:
Karl S. J. Hohlen, Chairman, Nebraska
Everett C. Fox, Section on Dermatology and Syphilology
Laurence S. Nelson Sr., Kansas
Orwood J. Campbell, Minnesota
Howard B. Goodrich, Missouri

Executive Session:
Clifford C. Sherburne, Chairman, Ohio
Carl H. Gellenthien, New Mexico
Willard A. Wright, North Dakota
John F. Burton, Oklahoma
Elmer Hess, Pennsylvania

Insurance and Medical Service:
William D. Stovall, Chairman, Wisconsin
William H. Halley, Colorado
Roland W. Stahr, Nevada
J. Stanley Kenney, New York
Britton E. Pickett Sr., Texas

Industrial Health:
Renato J. Azzari, Chairman, New York
J. Duffy Hancock, Kentucky
Frank H. Krusen, Section on Physical Medicine and Rehabilitation
John J. Curley, Massachusetts
L. Howard Schriver, Ohio

Medical Military Affairs:
Joseph H. Howard, Chairman, Connecticut
John W. Green, California
George M. Fister, Utah
Rutherford T. Johnstone, Section on Preventive and Industrial Medicine and Public Health
Walter P. Anderton, New York

Consultants
Silas B. Hays, United States Army
Clarence J. Brown, United States Navy
Dan C. Ogle, United States Air Force
Arden Freer, Veterans Administration

Miscellaneous Business:
Patrick J. Sullivan, Chairman, Massachusetts
B. R. Kirklin, Section on Radiology
Jay J. Crane, Section on Urology
Ross Wright, Washington
Peter M. Murray, New York

TELEVISION TO OPEN DOORS OF MEDICAL MEETING

For the first time, through the medium of television, physicians who are unable to attend the annual American Medical Association convention will be able to see at first-hand what is happening. The 101st Annual A. M. A. Convention will be held in Chicago, June 9-13.

Two half-hour, coast-to-coast telecasts of the convention are planned. As the nation's top medical authorities report on the very latest developments in the field of science and medicine to about 14,000 colleagues attending the meeting, mobile television cameras will transmit the news to the rest of the nation.

The programs, to be carried over the NBC television network on Tuesday evening, June 10, and at another date to be announced later, will be sponsored by Smith, Kline and French Laboratories, in cooperation with the A. M. A. The telecasts were conceived by Smith, Kline and French as part of its pioneering in the use of television for medical teaching.

The telecasts, which will be conducted on a strictly scientific and educational level, will present some of the highlights of the 300 scientific exhibits to be displayed at Navy Pier. Physicians watching a color television program of an operation, and the newest methods of life-saving, symposiums on heart and blood vessel diseases, obesity and diabetes, and numerous other interesting features will be among the presentations.

"These historic telecasts, besides transmitting important medical news to the physician at home and to his patients, will serve to demonstrate that the doctor's quest for life-saving knowledge never ends," said Dr. George F. Lull, Chicago, secretary and general manager of the A. M. A.

"An M.D. degree doesn't automatically give the doctor a healing touch. He must work and sweat to keep up with advancing science. His education is never completed. These programs will show one of the ways he continues to learn.

"The public should not expect a magician's show of medical miracles. Rather, they should expect a view of solid, useful medical progress which will ultimately benefit them."

These telecasts mark a milestone in the dynamic partnership of television and medicine, it was pointed out by C. Mahlon Kline, chairman of the board of the pharmaceutical firm, who added:

"Three years ago our inauguration of color television for medical teaching resulted in an entirely new approach to instruction at medical meetings. The surgical theater, the medical clinic, the doctor and the patient were brought into the meeting by television.

"Now, as the next logical step, television brings the medical meeting to the doctors who cannot attend the meeting and to the public, which is so vitally concerned with the progress revealed at these sessions."

COURSE IN BASIC ELECTROCARDIOGRAPHY

The Board of Trustees of the American Medical Association takes pleasure in inviting members of the Association to attend a course in basic electrocardiography at A. M. A. Headquarters, 535 North Dearborn Street, Chicago, June 3-6, 1952.

As seating accommodations are limited, registration for the course is necessary. Candidates will be considered in order of the time and date of mailing of their applications. Entrance cards will be mailed to successful applicants. There will be no fee for attendance. The subjects and lecturers are:

JUNE 3

Dr. Franklin D. Johnston, University of Michigan,
General Chairman

MORNING: What the electrocardiogram really is and its proper place in the diagnosis and management of heart disease.

AFTERNOON: Discussion of different types of electrocardiographic apparatus and important points relative to the technique for taking the proper records. Brief discussion of the electrophysiologic basis of electrocardiography.

DR. FRANKLIN D. JOHNSTON

JUNE 4

MORNING: The normal electrocardiogram—Discussion of the basic waves, important intervals, and criteria for normality in limb and precordial leads. The value of esophageal leads and the current status of spatial vectorcardiography.

DR. GEORGE E. BURCH
Tulane University

AFTERNOON: The use of the electrocardiogram in the cardiac arrhythmias.

DR. LOUIS N. KATZ
Michael Reese Hospital

JUNE 5

MORNING: The use of the electrocardiogram in estimation of cardiac hypertrophy. Intraventricular block. Abnormalities of the T waves (not including those due to myocardial infarction).

DR. GORDON B. MYERS
Wayne University

AFTERNOON: The use of the electrocardiogram in the diagnosis of angina pectoris and myocardial infarction. Electrocardiographic findings in pulmonary infarction.

DR. FRANCIS F. ROSENBAUM
Marquette University

JUNE 6

MORNING: Question and answer period. Informal discussion.

DR. JOHNSTON
DR. BURCH
DR. KATZ
DR. MYERS
DR. ROSENBAUM

Note: Problem electrocardiograms of registrants may be presented for discussion during the fourth day.

Arrangements under auspices of the Committee on Research, Paul L. Wermer, M.D., Secretary.

CHANGES IN THE MEMBERSHIP AND FELLOWSHIP STRUCTURE OF THE AMERICAN MEDICAL ASSOCIATION

Before 1949. Between the years 1913 and 1949, all physicians who were active members of their state society were non-dues-paying members of the American Medical Association. Of the 144,211 members of the A. M. A. in June, 1949, a total of 77,723 were listed as fellows. Fellows paid dues to the A. M. A. and received THE JOURNAL, or one of the special journals if they so elected.

1949. The House of Delegates of the A. M. A. assessed all members of the A. M. A. $25.00, but this assessment was not compulsory. This was the only assessment made.

1950. There was no assessment in 1950; however, for the first time membership dues were established, the amount being $25.00 per year. If these dues were not paid by the end of the year, the member was dropped for nonpayment; before he could be reinstated, it was necessary for him to pay the delinquent year's dues. The 1950 dues did not include a subscription to THE JOURNAL. A member in 1950, again through the payment of fellowship dues, received THE JOURNAL, or he could subscribe to it separately.

1951. The membership dues in the A. M. A. in 1951 were $25.00 and for the first time included a subscription to THE JOURNAL. Fellowship dues were reduced, but a subscription to THE JOURNAL was no longer included.

1952. Dues for membership during this year are the same as for 1951. There are no fellowship dues, and fellowship cards are not being issued. Fellowship may be abolished after the Annual Meeting of the A. M. A. in June, 1952.

The following summary will further clarify the changes from 1949 to 1952:

Membership in the American Medical Association	Fellowship in the American Medical Association	Subscription Price of THE JOURNAL
Membership dues in the A.M.A. never included fellowship dues. Membership dues have been payable only through the county and state societies.	Fellowship in the A.M.A. was dependent on membership in the state and county societies and the A.M.A. Fellowship dues were payable directly to the A.M.A. and were in addition to the membership dues.	Since Jan. 1, 1951, the price of THE JOURNAL has been included in membership dues; rates below for 1951 and 1952 are for nonmembers and laymen. Anyone may subscribe to THE JOURNAL.
1949 Assessed $25.00 but payment not compulsory	Dues of $12.00 included THE JOURNAL	$12.00
1950 Dues of $25.00 did not include THE JOURNAL	Dues of $12.00 included THE JOURNAL	$12.00
1951 Dues of $25.00 included THE JOURNAL	Dues of $5.00 did not include THE JOURNAL	$15.00
1952 Dues of $25.00 include THE JOURNAL	No fellowship dues for 1952	$15.00

MEDICAL NEWS

ARIZONA

State Medical Meeting at Phoenix.—The annual meeting of the Arizona Medical Association was held April 30 to May 3 in Phoenix under the presidency of Dr. Harry T. Southworth of Prescott. Among the papers presented by out-of-state speakers were the following:

Chronic Gastritis, Hale F. Shirley, San Francisco.
Anesthetic Problems and Emergencies, Scott M. Smith, Salt Lake City.
Cancer Detection—The Physicians Responsibility; Minimum Requirements for a Cancer Detection Examination; Realistic Appraisal of Its Value, Ian G. Macdonald, Los Angeles.
Recent Advances in Therapeutics, L. Maxwell Lockie, Buffalo.
Prevention of Coronary Thrombosis, William P. Thompson, Los Angeles.
Cor Pulmonale, Osborne A. Brines, Detroit.
Congenital Hips in the Practice of Every Physician, Harold E. Crowe, Los Angeles.
Isonicotinic Acid Hydrazine in Treatment of Tuberculosis, Edwin R. Levine, Chicago.
Thoracoplasty with Subscapular Paraffin Pack, William M. Lees, Chicago.

COLORADO

Clinical Day in Children's Diseases.—A clinical day for physicians interested in children's diseases will be sponsored by St. Francis Hospital and the University of Colorado School of Medicine May 21 at St. Francis Hospital, Colorado Springs. Dr. Mary S. Goodwin, consultant, Public Health Service, Federal Security Agency, will discuss "Diagnosis and Treatment of Congenital Syphilis."

CONNECTICUT

Psittacosis.—Dr. James C. Hart, Connecticut Department of Health, reports that six parakeets, found to be on sale and illegally brought into the state on Feb. 28, have been confiscated by the Milford Health Department. The birds were sent to the Virus and Rickettsial Laboratory in Montgomery, Ala., where the psittacosis virus was noted in five. The parakeets had been purchased in Chicago.

IDAHO

Outbreak of Typhoid.—Dr. Terrell O. Carver, Idaho Department of Public Health, has reported preliminary information on an outbreak of typhoid in Bonner County. In January, three cases appeared in one family in Sandpoint. Two of these were confirmed by bacteriological culture and the other by clinical symptoms. In February, two cases were reported from Priest River. The city of Sandpoint empties raw sewage into the Pend Orielle River and until recently the town of Priest River had obtained its water supply from the same river without chlorination. The three cases in Sandpoint have been traced to a chronic carrier, also a member of the family, who resides in Cusick, Wash.

ILLINOIS

Illinois Association of Blood Banks.—A panel discussion on the techniques and problems of blood banking will be featured at the meeting of the Illinois Association of Blood Banks in the Hotel Sherman, Chicago, on the afternoon of May 13. The panel will cover processing, donor selection and screening, grouping, Coombs test, reactions, and small community blood bank problems.

Lectures on Emotional Reactions.—A lecture on "Emotional Reactions to Fertility and Sterility" will be delivered by Dr. Boris B. Rubenstein, research associate at the Institute for Psychoanalysis and at the Institute for Psychosomatic and Psychiatric Research and Training of Michael Reese Hospital, Chicago, at 8 p. m. May 7 at the North Shore Health Resort, 225 Sheridan Road, Winnetka. This is one of a weekly series of lectures on emotional reactions to stress that is being offered by that institution.

Anesthesiologists Meeting.—The annual meeting of the Illinois Society of Anesthesiologists will be held at the Hotel Sherman, Chicago, May 12-13 under the presidency of Dr. Bryce K. Ozanne, Moline. Clinical demonstrations will be held from 8 to 11:30 a. m. on both days in various Chicago hospitals. Out-of-state speakers will include Dr. John E. Steinhaus, Madison, Wis., "Reactions to Local Anesthetic Drugs," Dr. John W. Pender, Rochester, Minn., "Care of the Patient During Mitral Commissurotomy," and Drs. Jacob J. Jacoby, Columbus, Ohio, and Vergil K. Stoelting, Indianapolis, whose subjects were not announced.

Society News.—The annual luncheon of the Illinois chapter of the American Academy of Pediatrics will be held May 13 in the Bal Tabarin room of the Hotel Sherman, Chicago. All physicians interested in pediatrics are invited to attend.——The Illinois Obstetrical and Gynecological Society will hold its annual meeting in the Hotel Sherman, Chicago, May 12 under the presidency of Dr. Ralph R. Loar, Bloomington. Dr. Virginia K. Pierce, New York, will present a paper on "Dilatation and Curettage as an Office or Outpatient Procedure." A panel discussion on "Results of a Two Year Hospital Survey by Districts" will be given by Drs. Joseph K. Hanson, Moline; Henry A. Hartman, Kankakee; Mary L. Newman, Jacksonville, and Andrew J. Hurter, Urbana, with Dr. Worling R. Young, Geneseo, as moderator.

State Medical Meeting in Chicago.—The Illinois State Medical Society will hold its annual meeting at the Hotel Sherman, Chicago, May 13-15 under the presidency of Dr. C. Paul White, Kewanee. Out-of-state speakers include the following:

Clifford F. Gastineau, Rochester, Minn., Electrolyte and Water Balance.
Richard M. Shick, Rochester, Minn., Dangers and Pitfalls of Dicumarol Therapy.
Henry L. Williams, Rochester, Minn., Treatment of Headaches.
John M. Caldwell, Washington, D. C., Preventive Psychiatry for the Physician.
Fay K. Alexander, Philadelphia, Diagnosis of Duodenal Ulcers in Children.
Cecil Stricker, Cincinnati, Diabetes Mellitus: An Orientation.
Harry F. Dowling, Washington, D. C., Problems in Practical Use of Antibiotics.
Charles L. Buxton, New York, Limitations of Hormones in Gynecology.
Claude J. Hunt, Kansas City, Mo., Trends in Surgical Treatment of Some Gastrointestinal Lesions.
Wolfgang W. Zuelzer, Detroit, Hemolytic Anemia in Children.
Hart E. Van Riper, New York, Rehabilitation—Prescription for Living.

A symposium on nutrition will be held May 14 and one on geriatrics May 15.

Chicago

Lecture on Professional Courtesy.—The second Arthur William Stillians Lecture of the Metropolitan Dermatological Society of Chicago will be given at its annual meeting May 14 by Dr. Erwin Paul Zeisler, professor of dermatology, Northwestern University Medical School, who will speak on "The Question of Professional Courtesy."

KANSAS

State Tumor Conference.—The Wichita County Medical Society Cancer Clinic will present the State Tumor Conference on May 15 at Midwestern University, Wichita Falls. Physicians are invited to attend the one day program, for which there is no registration fee. The speakers are as follows:

Arthur P. Stout, New York, Lesions of the Breast.
Juan A. del Regato, Colorado Springs, Colo., Treatment of Carcinoma of Cervix.
Claude F. Dixon, Rochester, Minn., Carcinoma of Rectum: Radical Surgical Treatment.

Physicians are invited to send to this department items of news of general interest, for example, those relating to society activities, new hospitals, education and public health. Programs should be received at least three weeks before the date of meeting.

KENTUCKY

Surgical Society to Meet.—The annual meeting of the Kentucky Surgical Society will be held May 24 at French Lick, Ind. Dr. Henry W. Cave of New York, guest speaker, will discuss "Management of Massive Hemorrhage from the Upper Gastrointestinal Tract."

New Child Health Foundation.—The main field of endeavor of the Kentucky Child Health Foundation, which is closely affiliated with the University of Louisville School of Medicine, will be in medical education, with stress on the promotion of better understanding of health and disease in children. The latest information on all aspects of child health, preventive, diagnostic, and curative, will be brought to the attention of the members of the University of Louisville School of Medicine faculty to further undergraduate instruction and postgraduate seminars.

Rural Health Conference.—The first state wide conference on rural health, organized by the state Rural Health Council, will convene at the Brown Hotel, Louisville, beginning at 2 p. m. May 7 and ending at noon, May 8. Guest speakers include Aubrey D. Gates, field director, American Medical Association Council on Rural Health; Sewall Milliken, chief of public health education division, Ohio State Department of Health; and Frank J. Welch, Ph.D., dean of the College of Agriculture of the University of Kentucky. Dr. Franklin S. Crockett, Lafayette, Ind., chairman of the American Medical Association Council on Rural Health, and Mrs. Charles W. Sewell, Otterbein, Ind., past president of the American Farm Bureau Federation Women's Organization, will talk at the dinner meeting at 6:30 p. m. The topics presented will cover community problems relating to rural health.

MARYLAND

Society News.—The spring scientific meeting of the Maryland Academy of General Practice will be held May 15 at the Hotel Alexander in Hagerstown. Medical films in color and sound, from 10 a. m. to 12 noon, will deal with urinary tract infections, cervicitis, and anticoagulant therapy. The afternoon session, from 1 to 5 p. m., will be devoted to a symposium on carcinoma presented by Drs. Richard H. Chamberlain, Isidor S. Ravdin, William T. Fitts Jr., Thomas E. Machella, Franklin L. Payne, Douglas P. Murphy, Robert C. Horn Jr., Joseph P. Atkins, and Julian Johnson, all of the University of Pennsylvania School of Medicine, Philadelphia.

MASSACHUSETTS

Society News.—The Norfolk District Medical Society will hold its annual dinner May 7 at 6 p. m. at the Harvard Club of Boston. Dr. Paul B. Magnuson, chairman of the President's Commission on the Health Needs of the Nation, will speak on "Mental Ramblings on Medical Care."

MICHIGAN

Dedicate St. John Hospital.—The new five million dollar St. John Hospital in suburban Detroit was dedicated March 9. This first new general hospital to be built under the Greater Detroit Hospital Plan will be operated by the Sisters of St. Joseph. It has 266 beds and 68 bassinets, with plans for future addition of 120 beds. There are four major and two minor operating rooms with space reserved for two more. The pediatric section will accommodate 58 children. Dr. Charles J. Jentgen, a graduate of the University of Michigan, has been named medical director.

Restoration of Beaumont Memorial.—Through a resolution adopted at its last annual session, the Michigan State Medical Society has undertaken the restoration of the William Beaumont Memorial. It is proposed that the replica be built in the American Fur Company Store on Mackinac Island, the scene of the meeting on June 19, 1822, of Dr. William Beaumont and the wounded Alexis St. Martin, which led to Dr. Beaumont's epochal studies on the action of the stomach's digestive processes. It is hoped that the memorial will be completed in 1952, so that it may commemorate the 130th anniversary of Dr. Beaumont's discoveries. Contributions are being made on a voluntary basis. Names of all contributors will be inscribed permanently in the Beaumont Memorial.

MINNESOTA

Art Exhibit.—The Minnesota Physicians' Art Association's third annual art exhibit will be held at the time of the meeting of the Minnesota State Medical Association, May 26-28, in the Minneapolis Auditorium. All art pieces should be sent to arrive between May 15 and May 21.

MISSOURI

Food Poisoning.—Dr. J. Earl Smith, St. Louis commissioner of health, has reported six cases of food poisoning that occurred in persons eating in a large hotel. Chocolate eclairs were eaten by those who became ill. Insanitary methods of handling this food and lack of refrigeration were demonstrated.

Annual Memorial Lecture.—Menorah Hospital Medical Center of Kansas City gave its annual memorial lecture on April 29. Dr. Jacob Lerman, associate physician at the Massachusetts General Hospital and clinical associate in medicine, Harvard Medical School, Boston, spoke on "Recent Advances in Thyroid Physiology and the Treatment of Thyroid Disease."

Annual Leo Loeb Lecture.—The annual Leo Loeb Lecture was presented April 17 at the Washington University Medical School by Dr. Paul B. Beeson, professor and chairman of the department of medicine, Emory University School of Medicine, Atlanta, who spoke on "Some Promising Leads in the Study of Infectious Diseases." The Leo Loeb Lectureship is sponsored by Mu chapter of Phi Beta Pi medical fraternity.

Basic Ophthalmology Course.—The department of ophthalmology of Washington University School of Medicine is forming its 1952-1953 class for the basic course in ophthalmology, to begin Sept. 15, 1952. Tuition is $800. The course is approved by the Veterans Administration. Instruction includes 393 hours of didactic work and 759 hours of clinical work. The course is limited to 12. Correspondence should be addressed to Dr. Richard G. Scobee, director of graduate training in ophthalmology, 640 S. Kingshighway Blvd., St. Louis 10.

Personals.—Dr. Walter C. Alvarez, Chicago, professorial lecturer at the University of Illinois, on March 31 gave the annual William H. Vogt lecture sponsored by Alpha Kappa Kappa fraternity of St. Louis University School of Medicine, St. Louis. ——Dr. Goronwy O. Broun, professor of internal medicine at St. Louis University School of Medicine, has given permission to the American Foundation for the Blind to record his book "Medical Essentials for Students of the Professions Allied to Medicine" for the use of the blind.——Dr. Arthur W. Proetz, professor of clinical otolaryngology at the Washington University School of Medicine, St. Louis, has been invited to deliver the annual Semon Lecture in London, which is a memorial to Sir Felix Semon, one of the distinguished laryngologists of the Victorian era.——Dr. Robert Dean Woolsey, instructor in surgery, St. Louis University School of Medicine, will deliver a report on "Review of 300 Cases of Protruded Intervertebral Disks Treated Surgically" before the International College of Surgeons meeting in Madrid, Spain, May 22.

MONTANA

Society Election.—At the recent semiannual meeting of the Montana Academy of Oto-Ophthalmology, Dr. Fritz D. Hurd, Great Falls, was elected president and Dr. Harvey L. Casebeer, Butte, secretary.

Medical-Surgical Conference.—On May 19-20 the Yellowstone Valley Medical Association will hold its annual Medical-Surgical Conference at Billings. Among the guest speakers will be Drs. Alton Ochsner, New Orleans, Elexious T. Bell, Minneapolis, Edgar V. Allen, Rochester, Minn., and Ernest M. Hammes, St. Paul.

NEW MEXICO

Annual State Medical Meeting.—The annual session of the New Mexico Medical Society will be held May 8-10 in Elks Hall, Carlsbad, under the presidency of Dr. Coy S. Stone of Hobbs. Out-of-state speakers include:

Mynie G. Peterman, Milwaukee, Fever Convulsions.
Curtis H. Burge, Houston, Roentgen Diagnosis of Gastrointestinal Lesions.
Paul Dudley White, Boston, Medical Practice 40 Years Ago and Now.
William F. Mengert, Dallas, Texas, Obstetrical Hemorrhage.
Oswald S. Lowsley, New York, Prostatic Surgery and Kidney Surgery.

The Woman's Auxiliary to the New Mexico Medical Society will meet May 9.

NEW YORK

Shigellosis.—The New York State Department of Health has reported an outbreak of bacillary dysentery, which occurred in an institution. In a group of 250 children, 46 became ill. All parts of the institution were involved in the outbreak. Shigella sonnei type of organisms were recovered from the stools of the patients.

Nu Sigma Nu Lecture.—Dr. William Dock, professor of medicine at the State University College of Medicine, New York, gave the annual Herman G. Weiskotten Lecture for Mu chapter of Nu Sigma Nu fraternity on April 22 at the State University College of Medicine at Syracuse. He spoke on "Anatomic and Metabolic Considerations in Coronary Artery Disease."

New York City

Course in Surgical Anatomy.—This course will be given at Cornell University Medical College June 2-28 as a full time course, five and a half days a week. It will consist of an intensive review of surgical anatomy, with demonstrations and dissection, and will be especially designed for candidates for the American Board of Surgery. Dr. Ernest W. Lampe will be in charge. Tuition is $200 and the registration is limited to 25. Inquiries may be directed to the Office of the Dean, Cornell University Medical College, 1300 York Ave., New York 21.

Postgraduate Pediatric Course.—The New York University Post-Graduate Medical School will hold a seminar on the rehabilitation of children May 19-23 at the Institute of Physical Medicine and Rehabilitation of the New York University-Bellevue Medical Center. Courses, to be held Monday through Friday from 9 a. m. to 5 p. m., will encompass the following subjects: poliomyelitis, cerebral palsy, spina bifida, muscular dystrophy, and cardiac conditions. Tuition fee is $30. Applications may be addressed to Dr. George G. Deaver, Director, Children's Division, Institute of Physical Medicine and Rehabilitation, 400 E. 34th St., New York 16.

Course at Cancer Center.—The pediatric department of the Memorial Center for Cancer and Allied Diseases announces a three day course May 21-23 for pediatricians, general practitioners, and health officers. The course includes established methods in diagnosis and management of tumors, Hodgkins disease, leukemia, and reticuloendotheliosis in childhood. Demonstrations, examinations of children in pediatric, surgical, chemotherapy, and radiotherapy clinics, ward rounds, and seminars are offered under the direction of the staffs of the Memorial Center and Sloan-Kettering Institute for Cancer Research. The fee is $35. Information may be obtained from the Director of Pediatric Service, Memorial Center, 444 E. 68th St., New York.

NORTH CAROLINA

University Alumni Day.—Two hundred and fifty alumni attended the first annual medical alumni day March 5. Participants in a roundtable discussion on the educational service functions of the medical school to the state included Drs. Samuel H. Proger, professor of medicine at Tufts College Medical School, Boston; Charles M. Caravati, associate professor of clinical medicine at the Medical College of Virginia, Richmond; Kinloch Nelson, professor of clinical medicine at the Medical College of Virginia, and John A. Ferrell, Raleigh, executive secretary of the North Carolina Medical Care Commission.

Personals.—Dr. John F. Fulton, Sterling Professor of the History of Medicine at Yale University, delivered the first Ross Herman Jennings Bryson Memorial Lecture at the University of North Carolina School of Medicine, Chapel Hill, on March 28, on "History of Neurology in the 17th and 18th Centuries." ——Dr. William P. Richardson, currently research professor of public health administration and head of the department of field training in the University of North Carolina School of Public Health, has been appointed professor of preventive medicine and assistant dean in charge of continuation education.——Dr. David A. Young, superintendent of the North Carolina Hospitals Board of Control, has been named clinical professor of psychiatry at the University of North Carolina.

Postgraduate Courses.—Duke University announces postgraduate courses to be given June 16-19. Dr. Ralph V. Platou, Tulane University of Louisiana School of Medicine, New Orleans, will present papers on "Prenatal Influences," "Birthmarks and Moles," "The Tuberculous Child," and "Congenital Disturbance of Bone Formation," and will participate in roundtable discussions on "Accidents in Children" and "Epilepsy." Presentations by Duke faculty members will include:

Jerome S. Harris, Congenital Heart Disease.
Angus M. McBryde, Prematurity.
Kenneth L. Pickrell, Common Plastic Surgical Problems in Children.
J. Lamar Callaway, Some Dermatological Problems in Children.
Susan C. Dees, The Allergic Child.
Leslie B. Hohman, The Problem Child.
Wilburt C. Davidson, Cancer in Children.
Arthur H. London, Common Pediatric Problems.

Ward rounds will be given on the various services each afternoon. Registration fee is $25. Rooms are available in the university dormitory at $2 a day.

PENNSYLVANIA

Pennsylvania Doctors in Service.—A total of 409 Pennsylvania doctors have been commissioned as medical officers in the Armed Forces and most of them are now serving. Dr. Francis F. Borzell of Philadelphia, chairman of the state advisory committee to the Selective Service System, reports that in no more than six areas has the taking of doctors placed a hazard on the health of the community.

State Radiological Society.—The annual meeting of the Pennsylvania Radiological Society will be held at Bedford Springs May 16-17. The program will open with a film reading session under Dr. Paul G. Bovard, Tarentum. Dr. Francis F. Borzell, Philadelphia, will speak on "The Structure of the A. M. A." Twelve papers are to be presented and followed by discussion. Dr. Jesse T. Littleton, Sayre, will speak by invitation on "The Thymus."

Child Research Clinic.—The Child Research Clinic of the Woods Schools, Langhorne, will hold its annual spring conference May 20 from 10 a. m. to 4 p. m. "Understanding the Exceptional Child" will be the topic discussed by Seymour B. Sarason, Ph.D., professor of psychology, Yale University, New Haven, Conn.; Dr. Leo Kanner, director of the Children's Psychiatric Service, Harriet Lane Home for Children, Johns Hopkins Hospital, Baltimore; Arthur S. Hill, chief, exceptional children and youth, Federal Security Agency, Washington, D. C.; Clara Savage Littledale, editor, *Parents' Magazine,* and Katharine G. Ecob, author. Those interested in attending the conference or in receiving copies of the proceedings may address A. Ralph Carli, Ed.D., director, Child Research Clinic, The Woods Schools, Langhorne.

Course in Reading Electrocardiograms.—A special course in electrocardiography designed to teach general practitioners the fundamentals involved in reading electrocardiograms will be held in the nurses' home of Westmoreland Hospital, Greensburg, under the sponsorship of the commission on graduate education of the Medical Society of the State of Pennsylvania. The dates for the lectures are May 15, 22, 29, and June 5, 12, 19, and 26. The faculty will include Drs. Charles W. Smith, Constantine P. Faller, and Kenne E. Quickel, all of Harrisburg Hospital; Dr. John B. Levan, [illegible] eph Hospital, ading, and Dr. Thomas

M. Durant, Philadelphia. Dr. Elmer Highberger Jr. of Greensburg is local director of the program. Enrollment may be made by mailing a check for $35 to the Commission on Graduate Education, 230 State St., Harrisburg.

Society News.—The annual joint meeting of the Diplomates Association of Berks County Physicians and the Reading Eye, Ear, Nose and Throat Society was held Feb. 20 in Reading. Dr. Howard T. Karsner, medical research advisor to the Bureau of Medicine and Surgery, Department of the Navy, Washington, D. C., spoke on "Modern Directions of Medical Investigation." The following officers of the Diplomates Association were elected for the ensuing year: Dr. William P. Jennings, president, Dr. John B. Levan, president-elect, and Dr. James E. Landis, secretary, all of Reading. Preceding the regular meeting, an organization meeting of the newly-formed Southeastern Pennsylvania Chapter of the American College of Surgeons was held. The following officers were elected: Dr. William L. Estes Jr., Bethlehem, president, Dr. Frank G. Runyeon, Reading, vice-president, and Dr. Irvin G. Shaffer, Reading, secretary.

Pittsburgh

Personal.—Dr. Daniel C. Braun, Library, Pa., co-chairman of the Commission on Industrial Health and Hygiene of the Medical Society of the State of Pennsylvania, has been appointed medical director of the Industrial Hygiene Foundation and a senior fellow of the Mellon Institute. He will also serve on the staff of the University of Pittsburgh Graduate School of Public Health as the lecturer on occupational health.

Course in Anesthesiology.—The University of Pittsburgh School of Medicine, section of anesthesiology, announces a postgraduate symposium on the "Basic Sciences Related to Anesthesiology" in cooperation with the departments of anesthesiology of the St. Francis, Allegheny General, and Mercy hospitals. This course will be held June 2-6 from 9 a. m. to 6 p. m. Registration fee is $25. Particulars may be obtained from the Chairman of the Committee on Graduate Medical Education, University of Pittsburgh School of Medicine, 3941 O'Hara St., Pittsburgh 13.

SOUTH DAKOTA

State Medical Meeting at Sioux Falls.—The South Dakota State Medical Association will hold its annual meeting at the Cataract Hotel, Sioux Falls, May 18-20 under the presidency of Dr. David A. Gregory of Milbank. Dr. Earl O. Latimer, Chicago, will speak on "Surgery of the Gallbladder and Biliary Tract" and "Treatment of Varicose Veins." Dr. George B. Logan, Rochester, Minn., will speak on "Treatment of Children Having Asthma" and "Obstructions of the Upper Respiratory Tract in Children." Other out-of-state speakers will include the following:

John W. Cline, San Francisco, President of the American Medical Association, Medicine Today.
Harold Gifford, Omaha, Postoperative Care of Eye Patients 25 Years Ago and Now.
Harvey S. Allen, Chicago, Hand Surgery.
Russell D. Herrold, Chicago, Antimicrobial Therapy in Urology.
Wesley W. Spink, Minneapolis, Treatment of Human Brucellosis.
James C. Cain, Rochester, Minn., Treatment of Duodenal Ulcers.
H. Marvin Pollard, Ann Arbor, Mich., Present Management of Peptic Ulcer.

TENNESSEE

Narcotic Violation.—Dr. William Alexander Thompson, Chattanooga, pleaded guilty in the United States District Court at Chattanooga on Nov. 14, 1951, to an indictment charging violation of the Federal narcotic law. On Feb. 21 his sentence was suspended, and he was placed on probation for two years.

ersonal.—Donald B. Zilversmit, Ph.D., Memphis, assistant rofessor of physiology, University of Tennessee Medical Units, eceived a medal from Queen Juliana of the Netherlands for services in the Dutch Army during World War II.

UTAH

Annual Surgical Meeting.—The annual meeting of the Ogden Surgical Society will be held under the presidency of Dr. George M. Fister of Ogden on May 21-23 at the Orpheum Theatre, Ogden. Collaborating in a symposium on "Acute Abdomen" at 3 p. m. on Thursday will be Drs. J. Garrott Allen, Chicago; Albert H. Aldridge, New York; John L. Emmett, Rochester, Minn.; Raymond W. McNealy, Chicago; I. S. Ravdin, Philadelphia, and Eugene A. Stead Jr., Durham, N. C. Dr. Alton Ochsner, New Orleans, will serve as moderator. Dr. John W. Cline of San Francisco, President of the American Medical Association, will deliver an address on "Problems Confronting American Medicine in the Immediate Future."

WEST VIRGINIA

Society News.—The annual meeting of the West Virginia Academy of Ophthalmology and Otolaryngology will be held at the Greenbrier, White Sulphur Springs, May 12-13 under the presidency of Dr. Arthur C. Chandler of Charleston. Out-of-state speakers will be Dr. Peter A. Pastore of Richmond, Va., who will present a paper on "Otitis Media and Mastoiditis Today," and Dr. John G. Bellows of Chicago, who will discuss "Senile Changes in the Crystalline Lens."

Petition for Osteopathic Injunction.—A petition was filed early in March in the circuit court of Wyoming County, asking for an injunction prohibiting Glenn E. Cobb, an osteopath of Oceana, from practicing medicine and surgery. The petition cites three specific instances in which Cobb administered drugs or performed an operation and sets forth that Cobb is not licensed to practice medicine and surgery in West Virginia. The filing of the petition follows an opinion, handed down a few months ago by the attorney general, in which he held that the present law prohibits osteopaths from administering drugs and performing surgery. The petition was signed by the 11 members of the Medical Licensing Board and by 5 doctors of medicine in their individual capacities. The case was docketed for hearing by the Wyoming County circuit court at the April term.

GENERAL

Goiter Association Meeting.—The annual meeting of the American Goiter Association was held in St. Louis May 1-3 under the presidency of Dr. Willard O. Thompson of Chicago. Thirty-seven papers were presented, and eight were read by title.

Society for Pediatric Research.—This society will hold its annual meeting at the Hotel Chamberlin, Old Point Comfort, Va., May 5-7 under the presidency of Dr. Horace L. Hodes, New York. According to the preliminary program, 39 papers will be presented and 57 read by titles.

Society News.—The annual meeting of the Association of American Physicians will be held in Chalfonte-Haddon Hall Hotels, Atlantic City, N. J., May 6-7 under the presidency of Dr. Oswald H. Robertson, Chicago. A series of 36 papers will be presented, and 18 will be read by title. Dr. Ralph H. Major of Kansas City, Mo., will speak at the dinner on Tuesday.

Pediatrics Meeting.—The area meeting of the American Academy of Pediatrics will be held at the Hotel Statler, Washington, D. C., May 22-24 under the presidency of Dr. Warren W. Quillian, Coral Gables, Fla. In a panel discussion on problems of current interest in neonatal pediatrics, May 22 at 9:45 a. m., physiological aspects will be discussed by Dr. Clement A. Smith and clinical considerations by Dr. Stewart H. Clifford, both of Boston; pathological aspects by Dr. Edith L. Potter, Chicago, and public health aspects by Dr. Leona Baumgartner, New York.

General Practice Awards.—Dr. Charles E. McArthur, M and R Award Committee chairman of the American Academy of General Practice, recently presented the first year's awards, an engraved plaque together with a check for $1,000, to Dr. J. DeWitt Fox of Washington, D. C., for his paper on "ACTH and Cortisone—Miracle Therapy or Medical Tool?" and to Dr. David G. Miller Jr., Morgantown, Ky., for his paper on "Bites and Stings." These articles appeared in *GP*, the official organ of the academy.

Gordon Research Conferences.—The Gordon Research Conferences on vitamins and metabolism, sponsored by the American Association for the Advancement of Science, will be held from June 16 to Aug. 29 at Colby Junior College, New London,

N. H. The conferences are planned to stimulate research in universities, research foundations, and industrial laboratories through scheduled lectures and free discussion groups. Requests for attendance at the conferences should be addressed to W. George Parks, Ph.D., Director, Department of Chemistry, University of Rhode Island, Kingston, R. I., before May 15.

Annual Urological Meeting.—The Western Section of the American Urological Association will hold its annual meeting under the presidency of Dr. Paul A. Ferrier, Pasadena, Calif., on May 19-22 at the Hotel Huntington in Pasadena. Guest speakers will be Drs. William W. Scott, professor of urology at Brady Urological Institute, Baltimore, and Rubin Flocks, professor of urology at the University of Iowa, Iowa City. The winners of the Joseph F. McCarthy Award will be announced and the prize winning essay read at one of the scientific sessions. The social program will include a golf tournament, sightseeing, dinner dance, and theatre party.

American Laryngological Association.—The annual meeting of this association will be held at the Royal York Hotel, Toronto, Canada, May 23-24 under the presidency of Dr. H. Marshall Taylor of Jacksonville, Fla. Those speaking by invitation include:

Fredrick T. Hill, Waterville, Me., and Irving I. Goodof, Lewiston, Me., Branchiogenic Carcinoma.
Oliver E. Van Alyea and Carl D. Makart, both of Chicago, Rhinolith—Case Report.
Howard C. Ballenger and John J. Ballenger, both of Winnetka, Ill., Vacuum Frontal Sinusitis. Absorption of Air from the Frontal Sinus. Experimental Study on Dogs.

American Psychoanalytic Association.—This association will hold its annual meeting at the Chalfonte-Haddon Hall Hotels, Atlantic City, N. J., May 8-11 under the presidency of Dr. Robert P. Knight, Stockbridge, Mass. Those speaking by invitation include the following:

Peter H. Knapp, Boston, The Ear, Listening and Hearing.
Bruno Bettelheim, Ph.D., Chicago, Initiation Rites in Relation to Menstruation and Child Bearing.
David Rapaport, Ph.D., Stockbridge, Mass., Attempt to Systematize Fragments of the Psychoanalytic Theory of Affects.
Kurt Goldstein, New York, Effect of Brain Damage on the Personality.
Eugene B. Brody, and Frederic C. Redlich, New Haven, Conn., Response to Humor as Indication of Ego Function in Schizophrenic Patients Before and After Lobotomy.
Louis Linn, New York, Trauma and Denial.

Electroencephalographic Meeting.—The annual meeting of the American Electroencephalographic Society will be held at the Hotel Claridge, Atlantic City, N. J., May 10-11 under the presidency of Dr. James L. O'Leary of St. Louis. On Saturday at 9 p. m. after the annual dinner, Dr. John C. Lilly and Ruth Cherry of the Johnson Foundation, University of Pennsylvania, Philadelphia, will deliver an invitational address on "Criteria for the Parcelation of the Cortical Surface into Functional Areas." A symposium on "EEG in Relation to Psychiatry" will be held Sunday at 9:30 a. m. under the chairmanship of Hudson Hoagland, Ph.D., of Shrewsbury, Mass. Participants and their topics will be as follows:

Walter R. Ingram, Ph.D., Iowa City, Brain Stem Mechanisms and Behavior.
Paul D. MacLean, New Haven, Conn., Some Psychiatric Implications of Physiological Studies in the Fronto-Temporal Portion of the Limbic System (Visceral Brain).
Denis Hill, London, England, EEG Studies in Episodic and Psychotic Behavior.
Donald B. Lindsley, Ph.D., Los Angeles, Psychological Phenomena and EEG.
David M. Rioch, Rockville, Md., Resumé: Clinical and Experimental Considerations.

Careers in Service to the Handicapped.—A brochure on "Careers in Service to the Handicapped" has been prepared by the Easter Seal Society to help young people secure information about positions in the fields of rehabilitation of the handicapped. Information from which the manual was prepared was supplied by the American Physical Therapy Association, the American Occupational Therapy Association, the American Speech and Hearing Association, and the International Council for Exceptional Children. It is jointly published by the National Society for Crippled Children and Adults and the National Foundation for Infantile Paralysis, with the cooperation of the Office of Vocational Rehabilitation of the Federal Security Agency. Young people choosing rehabilitation as a career will find available choice jobs in every section of the country. The National Society for Crippled Children and Adults will distribute, free of charge, more than 23,000 copies of "Careers in Service to the Handicapped" to public and parochial school systems; in addition, copies will be given to every college and university throughout the United States. After the initial distribution, individual copies will be available at $0.50 each.

Aero Medical Association.—This association at its meeting in Washington, D. C., in March installed Dr. William R. Stovall of Washington, D. C., as president and chose as officers for the coming year: Rear Admiral Bertram Groesbeck Jr., MC, USN, Washington, D. C., president-elect; Dr. Armand Robert, Paris, France, Dr. Percy B. Wiltberger, Columbus, Ohio, Dr. Alberto Hurtado, Lima, Peru, Dr. Harold B. Dye, Merriam, Kan., and Dr. Wilbur R. Franks, Toronto, Canada, vice presidents; and Dr. Thomas H. Sutherland, Marion, Ohio, secretary-treasurer. The Longacre Award, established in 1947 for outstanding contributions in psychological or psychiatric aspects of aviation medicine, was presented to Sir Frederic Bartlett, Cambridge University, England. The Theodore C. Lyster Award, established in 1947 for outstanding contributions in the general field of aviation medicine, was presented to Dr. Kenneth A. Evelyn, Montreal, Canada. A special feature of the Honor's Night Dinner was the presentation by Major General Harry G. Armstrong, surgeon general, USAF, and outgoing president of the association, of specially embroidered flight surgeons' wings to Dr. Conrad Berens, New York, probably the first flight surgeon, and Dr. Louis H. Bauer, Hempstead, N. Y., founder of the Aero Medical Association. The wives of members in attendance officially formed the Wives' Wing of the Aero Medical Association to support the efforts of their husbands in the advancement of aviation medicine.

FOREIGN

International Congress of Sports Medicine.—This congress under the auspices of the State Secretariat for Technical Instruction and for Sports for Young Persons and of the International Federation of Sports Medicine will be held in Paris May 30 to June 1 under the presidency of Prof. Chailly-Bert. Information may be obtained from Dr. Collet, president of the Comité d'Organisation du IXième Congrès de Médecine Sportive, Comité National des Sports, 4, rue d'Argenson, Paris 8ième, France.

Summer Jobs in Israel.—The Jewish Agency for Palestine offers summer jobs to medical students and x-ray and laboratory technicians who have finished three years of college study and to young medical postgraduates. During their three months' stay in Israel, they will be placed in various medical institutions throughout the country, where they will be able to exchange valuable experience with their colleagues in Israel. The agency guarantees accommodations and will provide all the necessary living expenses during the stay. The only expense to be incurred by the students will be round trip fare to Israel, which amounts to about $600. Information may be obtained from the Coordinator, Israel Summer Programs, Jewish Agency for Palestine, 16 E. 66th St., New York 21.

CORRECTIONS

Gastric Polyps.—In the paper on this subject in The Journal, March 29, 1952, page 1093, in the sixth line under case 7, the hemoglobin should have been 7.15 gm. per 100 cc. and in the fourth line of the second paragraph in this case report the hemoglobin level should have been 9.01 gm. per 100 cc.

Influence of Alcohol on Auto Driving.—In the item by this title in the letter from Sweden in The Journal, April 12, 1952, page 1357, the blood alcohol level data, stated in terms of per cent, all differ from the correct values by a factor of 10. For example, in the last line of the first paragraph the figure should be 0.035 and 0 [illegible]. The other lev[illegible] in this it[illegible] should similarly [illegible]ed by 10 to [illegible]rect fig[illegible]

MEETINGS

American Medical Association, Chicago, June 9-13. Dr. George F. Lull, 535 North Dearborn St., Chicago 10, Secretary.

American Academy of Pediatrics, Areal Meeting, Hotel Statler, Washington, D. C., May 22-24. Dr. E. H. Christopherson, 636 Church St., Evanston, Ill., Executive Secretary.

American Academy of Tuberculosis Physicians, Chicago, June 7. Dr. Oscar S. Levin, P. O. Box 7011, Denver, Secretary.

American Association for Thoracic Surgery, Dallas, Texas, May 8-10. Dr. Paul C. Samson, 2938 McClure St., Oakland 9, Calif., Secretary.

American Association of Genito-Urinary Surgeons, Seaview Country Club, Absecon, N. J., June 19-21. Dr. Norris J. Heckel, 122 South Michigan Ave., Chicago 3, Secretary.

American Association on Mental Deficiency, Hotel Bellevue-Stratford, Philadelphia, May 26-31. Dr. Neil A. Dayton, P. O. Box 96, Willimantic, Conn., Secretary.

American Blood Irradiation Society, Conrad Hilton Hotel, Chicago, June 7-8. Dr. H. T. Lewis, 5230 Center Ave., Pittsburgh, Secretary.

American Broncho-Esophagological Association, Royal York Hotel, Toronto, Canada, May 20-21. Dr. Edwin N. Broyles, 1100 North Charles St., Baltimore 1, Secretary.

American College of Chest Physicians, Congress Hotel, Chicago, June 5-8. Mr. Murray Kornfeld, 112 East Chestnut St., Chicago, Executive Secretary.

American College of Surgeons, Sectional Meetings:
Toronto, Canada, Royal York Hotel, May 15-17. Dr. Stuart D. Gordon, 170 St. George St., Toronto 5, Canada, Chairman.

American Diabetes Association, Drake Hotel, Chicago, June 7-8. Dr. J. A. Reed, 11 West 42d St., New York 36, Secretary.

American Electroencephalographic Society, Hotel Claridge, Atlantic City, N. J., May 10-11. Dr. John A. Abbott, Massachusetts General Hospital, Boston 14, Secretary.

American Federation for Clinical Research, Haddon Hall, Atlantic City, N. J., May 4. Dr. Stewart Wolf, 525 East 68th St., New York 21, Secretary.

American Geriatrics Society, Hotel LaSalle, Chicago, June 5-7. Dr. Malford W. Thewlis, 25 Mechanic St., Wakefield, R. I., Secretary.

American Gynecological Society, The Homestead, Hot Springs, Va., May 12-14. Dr. John I. Brewer, 104 South Michigan Ave., Chicago, Secretary.

American Hearing Society, Chicago, June 28. Mrs. Francis E. Lee, 817 14th St. N.W., Washington 5, D. C., Secretary.

American Laryngological Association, Royal York Hotel, Toronto, Canada, May 23-24. Dr. Louis H. Clerf, 1530 Locust St., Philadelphia 2, Secretary.

American Laryngological, Rhinological and Otological Society, Royal York Hotel, Toronto, Canada, May 20-22. Dr. C. Stewart Nash, 277 Alexander St., Rochester 7, N. Y., Secretary

American Medical Women's Association, Chicago, June 8. Dr. Irma Henderson-Smathers, 610 Medical Bldg., Asheville, N. C., Corresponding Secretary.

American Neurological Association, Hotel Claridge, Atlantic City, N. J., May 8-10. Dr. H. Houston Merritt, 710 West 168th St., New York 32, Secretary.

American Ophthalmological Society, Hot Springs, Va., June 5-7. Dr. Maynard C. Wheeler, 30 West 59th St., New York 19, Secretary.

American Otological Society, Royal York Hotel, Toronto, Canada, May 18-19. Dr. John R. Lindsay, 950 East 59th St., Chicago 37, Secretary.

American Pediatric Society, Hotel Chamberlin, Old Point Comfort, Va., May 7-9. Dr. Aims C. McGuiness, 237 Medical Laboratories, Univ. of Pennsylvania, Philadelphia 4, Secretary.

American Proctologic Society, Milwaukee, June 4-7. Dr. Stuart T. Ross, 131 Fulton Ave., Hempstead, L. I., N. Y., Secretary.

American Psychiatric Association, Atlantic City, N. J., May 12-16. Dr. R. Finley Gayle Jr., 6300 Three Chopt Rd., Richmond 21, Va., Secretary.

American Psychoanalytic Association, Chalfonte-Haddon Hall, Atlantic City, N. J., May 8-11. Dr. LeRoy M. A. Maeder, 1910 Rittenhouse Square, Philadelphia 3, Secretary.

American Radium Society, Chicago, June 8. Dr. John Wirth, 635 Herkimer St., Pasadena 1, Calif., Secretary.

American Rheumatism Association, Conrad Hilton Hotel, Chicago, June 6-7. Dr. William H. Kammerer, 33 East 61st St., New York 21, Secretary.

American Society for Clinical Investigation, Atlantic City, N. J., May 5. Dr. William M. M. Kirby, Univ. of Washington School of Medicine, Seattle 5, Secretary.

American Society for the Study of Sterility, Chicago, June 7-8. Dr. Walter W. Williams, 20 Magnolia Terrace, Springfield 8, Mass., Secretary.

American Therapeutic Society, Blackstone Hotel, Chicago, June 5-8. Dr. Oscar B. Hunter Jr., 915 Nineteenth St. N.W., Washington 6, D. C., Secretary.

American Trudeau Society, Hotel Statler, Boston, May 26. Dr. John D. Steele, 1790 Broadway, New York 19, Secretary.

American Urological Association, Chalfonte-Haddon Hall, Atlantic City, N. J., June 23-26. Dr. Charles H. deT. Shivers, Boardwalk National Arcade Bldg., Atlantic City, N. J., Secretary.

Association of American Physicians, Atlantic City, N. J., May 6-7. Dr. Henry M. Thomas Jr., 1201 North Calvert St., Baltimore 2, Secretary.

Catholic Hospital Association of the United States and Canada, Cleveland, May 26-29. Rev. John J. Flanagan, S.J., 1438 South Grand Blvd., St. Louis 4, Director.

Georgia, Medical Association of, Atlanta-Biltmore Hotel, Atlanta, May 12-14. Dr. David H. Poer, 875 West Peachtree St. N.E., Atlanta, Secretary.

Idaho State Medical Association, Sun Valley, June 15-18. Dr. Robert S. McKeon, 305 Sun Bldg., Boise, Secretary.

Illinois State Medical Society, Hotel Sherman, Chicago, May 13-15. Dr. Harold M. Camp, 224 South Main St., Monmouth, Secretary.

Maine Medical Association, Samoset Hotel, Rockland, June 22-24. Mr. W. Mayo Payson, 142 High Street, Portland 3, Executive Secretary.

Massachusetts Medical Society, Hotel Statler, Boston, May 20-22. Dr. H. Quimby Gallupe, 22 Fenway, Boston 15, Secretary.

Medical Library Association, Lake Placid Club, Lake Placid, N. Y., June 24-27. Miss Caroline Riechers, 1758 West Harrison St., Chicago 12, Secretary.

Minnesota State Medical Association, Minneapolis, May 26-28. Dr. B. B. Souster, 496 Lowry Medical Arts Bldg., St. Paul 2, Secretary.

Mississippi State Medical Association, Jackson, May 13-15. Mr. Roland B. Kennedy, 508 First Federal Bldg., Jackson, Executive Secretary.

National Tuberculosis Association, Copley Plaza and Statler Hotels, Boston, May 26-30. Mr. Kemp D. Battle, 1790 Broadway, New York 19, Secretary.

Nebraska State Medical Association, Cornhusker Hotel, Lincoln, May 12-15. Dr. R. B. Adams, 1315 Sharp Bldg., Lincoln 8, Secretary.

New Jersey, Medical Society of, Haddon Hall, Atlantic City, May 19-21. Dr. Marcus H. Greifinger, 315 West State St., Trenton 8, Secretary.

New Mexico Medical Society, Carlsbad, May 8-10. Dr. L. G. Rice Jr., 221 West Central Ave., Albuquerque, Secretary.

New York, Medical Society of the State of, Hotel Statler, New York, May 12-16. Dr. Walter P. Anderton, 292 Madison Ave., New York 17, Secretary.

North Carolina, Medical Society of the State of, Hotel Carolina, Pinehurst, May 5-7. Dr. Millard D. Hill, 203 Capitol Club Bldg., Raleigh, Secretary.

North Dakota State Medical Association, Fargo, May 10-13. Dr. E. H. Boerth, 221 Fifth St., Bismarck, Secretary.

Ogden Surgical Society, Orpheum Theater, Ogden, Utah, May 21-23. Dr. George M. Fister, Ogden, Utah, President.

Ohio State Medical Association, Cleveland, May 20-22. Mr. Charles S. Nelson, 79 East State St., Columbus 15, Executive Secretary.

Oklahoma State Medical Association, Oklahoma City, May 19-21. Mr. R. H. Graham, 1227 Classen St., Oklahoma City, Executive Secretary.

Rhode Island Medical Society, Providence, May 6-8. Dr. Morgan Cutts, 106 Francis St., Providence 3, Secretary.

Society for Investigative Dermatology, Hotel Sherman, Chicago, June 7-8. Dr. Herman Beerman, 255 South 17th St., Philadelphia 3, Secretary.

Society for Pediatric Research, Old Point Comfort, Va., May 5-6. Dr. Sydney S. Gellis, 300 Longwood Ave., Boston 15, Secretary.

Society for Vascular Surgery, Chicago, June 8, Dr. George D. Lilly, 331 Ingraham Bldg., Miami 32, Fla., Secretary.

Society of Biological Psychiatry, Hotel Claridge, Atlantic City, N. J., May 11. Dr. George N. Thompson, 1136 West Sixth St., Los Angeles 17, Secretary.

South Carolina Medical Association, Ocean Forest Hotel, Myrtle Beach, May 13-15. Dr. N. B. Heyward, 120 West Cheves St., Florence, Secretary.

South Dakota State Medical Association, Sioux Falls, May 18-20. Dr. L. J. Pankow, 302 First National Bank Bldg., Sioux Falls, Secretary.

Southern Oregon Medical Society, Roseburg, May 13. Dr. F. C. Adams, *1435 Esplanade St., Klamath Falls, Secretary.*

Texas Medical Association, Dallas, May 4-7. Dr. Sam N. Key Sr., 700 Guadalupe St., Austin 3, Secretary.

The Endocrine Society, Palmer House, Chicago, June 5-7. Dr. Henry H. Turner, 1200 North Walker St., Oklahoma City 3, Secretary

Upper Peninsula Medical Society, Country Club, Iron Mountain, Mich., June 27-28. Dr. E. Theodore Palm, 412 Superior Ave., Crystal Falls, Mich., Secretary.

Wyoming State Medical Society, Nobel Hotel, Lander, June 5-7. Dr. Glenn W. Koford, 2020 Carey Ave., Cheyenne, Secretary.

INTERNATIONAL

Australasian Medical Congress, Melbourne Victoria, Australia, Aug. 22-30. Dr. C. H. Dickson, Medical Society Hall, 426 Albert St., East Melbourne, Victoria, Australia, General Secretary.

Commonwealth and Empire Health and Tuberculosis Conference, Central Hall, London, England, July 8-13. Dr. J. H. Harley Williams, Tavistock House North, Tavistock Sq., London, W.C.1, England, Secretary General.

Congress of the International Diabetes Federation, Leyden, Netherlands, July 7-12. Dr. F. Gerritzen, 33. Prinsegracht, The Hague, Netherlands, Secretary.

European Congress of Cardiology. University of London, Bloomsbury, W.C.1, England, Sept. 10-12. Dr. K. Shirley Smith, 35 Wimpole St., London, W.1, England, Secretary.

European Society of Cardiovascular Surgery, Strasbourg, France, Oct. 3-4. Sir James Learmonth, Department of Surgery, University New Buildings, Edinburgh 8, Scotland.

Interamerican Cardiological Congress, Buenos Aires, Argentina, Aug. 31-Sept. 7. Dr. Blas Moia, Larrea 1132, Buenos Aires, Argentina, Secretary-General.

Inter-American Congress of Public Health, Havana, Cuba, Sept. 27-Oct. 1. Pan-American Sanitary Bureau, 2001 Connecticut Ave., Washington, D. C.

Inter-American Congress of Radiology, Mexico City, Mexico, Nov. 2-8. Dr. Guido Torres Martinez, Marsella No. 11, Mexico, D.F., Secretary-General.

International College of Surgeons, Madrid, Spain, May 20-24. Dr. Max Thorek, 850 West Irving Park Road, Chicago, Ill., U. S. A., Secretary-General.

International Congress of Biochemistry, Paris, France, July 21-27. Prof. Jean Courtois, 4, Avenue de l'Observatoire, Paris 6^e, France, Secretary.

International Congress of Comparative Pathology, Madrid, Spain, May 4-11. Prof. Carda-Aparici, Calle Fernando VI.8, Madrid, Spain, Secretary.

International Congress of Dermatology and Syphilology, London, England, July 21-26. Dr. Gordon B. Mitchell-Heggs, 5, Lisle St., London, W.C.2, England, General Secretary.

International Congress of Dietetics, Royal Tropical Institute, Amsterdam, The Netherlands, July 7-11. Miss Diane J. *Ten Haaf, Educational* Bureau of the Nutritional Council, 42 Koninginnegracht, The Hague, Netherlands, General Secretary.

International Congress on Diseases of the Chest, Rio de Janeiro, Brazil, Aug. 24-30. Mr. Murray Kornfeld, 112 East Chestnut St., Chicago 11, Illinois, Executive Secretary.

International Congress of Haematology, Mar del Plata, Argentina, Sept. 21-26. Dr. Carlos Reussi, Anchorena 1710, Buenos Aires, Argentina, Secretary.

International Congress of Health Technicians, Palais de la Mutualite, Paris, France, June 9-14. Secretariat General, 6 Square Desaix, Paris XV^e, France.

International Congress of the History of Medicine, Nice-Cannes, France, and Monaco, Sept. 8-18. Dr. F. A. Sondervorst, 124 Avenue des Allies, Louvain, Belgium, Secretary-General.

International Congress of Internal Medicine, Friends House, London, N.W.1, Eng. Sept. 15-18. Sir Harold Boldero, 12 Pall Mall East, London, S.W.1, England, Secretary.

International Congress on Medical Records, London, England, Sept. 7-12. *Miss Gwen Perkins, 120 C Street S.E.*, Washington, D. C., Chairman.

International Congress of Medicine and Sport, Paris, France. May 29-June 1. Prof. Chailley-Bert, 1 rue Lacretelle, Paris 15^e, France, Chairman.

International Congress on Neuropathology, Rome, Italy, Sept. 8-13. Dr. Armando Ferraro, 722 W. 168th St., New York, N. Y., U. S. A., Secretary General.

International Congress of Physical Medicine, London, England, July 14-19. Dr. A. C. Boyle, 45, Lincoln's Inn Fields, London, W.C.2, England, Hon. Secretary.

International Congress of Physiopathology of Animal Reproduction and Artificial Insemination, Copenhagen, Denmark, July 7-10. Prof. Ed. Sorensen, The Royal Veterinary and Agricultural College, Bülowsvej 13, Copenhagen V, Denmark.

International Congress of Urology, The Waldorf-Astoria, New York, N. Y., U. S. A., Sept. 15-18. Dr. John A. Taylor, 2 East 54th St., New York, N. Y., U. S. A., Secretary-General.

International Society of Geographic Pathology, Liège, Belgium, July 15-18. Dr. Fred C. Roulet, Habelstr. 24, Basel, Switzerland, Secretary General.

International Union Against Tuberculosis, Rio de Janeiro, Brazil, Aug. 24-27. Prof. Etienne Bernard, 66 Blvd. St. Michel, Paris 6e, France, Secretary-General.

Neuroradiologic Symposium, Stockholm, Sweden, Sept. 17-20. Docent Ake Lindbom, Symposium Neuroradiologicum, Serafimerlasarettet, Stockholm K., Sweden, Secretary.

Pan-American Congress of Gastroenterology, Mexico City, D F., May 11-17. *Dr. R. Flores-Lopez, Calle Dr. Balmis, No. 148, Mexico City,* D.F., Secretary.

World Medical Association, Athens, Greece, Oct. 12-16. Dr. Louis H. *Bauer, 2 East 103d St., New York 29, N. Y., Secretary* General

EXAMINATIONS AND LICENSURE

NATIONAL BOARD OF MEDICAL EXAMINERS

National Board of Medical Examiners: *Parts I and II*, June 18-20; *Part I*, September. All centers where there are five or more candidates. Exec. Sec., Dr. John P. Hubbard, 225 S. 15th St., Philadelphia 2.

EXAMINING BOARDS IN SPECIALTIES

American Board of Anesthesiology: Various Locations, July 18. Final date for filing application was Jan. 18. Sec., Dr. C. B. Hickcox, 80 Seymour St., Hartford 15.

American Board of Dermatology and Syphilology: *Oral.* Chicago, May 1952. Final date for filing application was Feb. 1, 1952. Candidates must have completed three years of approved training prior to July 1, 1952. Sec., Dr. George M. Lewis, 66 E. 66th St., New York 21.

American Board of Internal Medicine: *Written.* Various centers and *overseas, Oct. 20. Closing date for the* acceptance of applications for the written examination will be May 1. *Oral.* Chicago, June 5-7, San Francisco, September or October; New York City, November or *December.* Subspecialty: Gastroenterology. *Examination.* Chicago, June 7. Exec. Sec.-Treas., Dr. William A. Werrell, 1 West Main Street, *Madison* 3.

American Board of Neurological Surgery: *Oral.* Chicago, *May* 1952. Final date for filing *applications for the May* 1952 *examination* was Jan. 1. Sec., Dr. W. J. German, 789 Howard Ave., New Haven 4, Conn.

American Board of Obstetrics and Gynecology: *Oral.* Chicago, June 7-13, *1952. Final* date for filing application was Feb. 1, 1952. Sec., Dr. Robert L. Faulkner, 2105 Adelbert Road, Cleveland 6.

American Board of Ophthalmology: *Practical.* Philadelphia, May 29-June 3; Chicago, Oct. 6-10 and New York City, *June* 6-10, 1953. Sec., Dr. Edwin B. Dunphy, 56 Ivie Road, Cape Cottage, *Maine.*

American Board of Otolaryngology. Toronto, *May 13-17; Chicago*, Oct. 6-10. Sec., Dr. Dean M. Lierle, University Hospitals, Iowa City.

American Board of Pediatrics: *Oral.* Washington, D. C., *May* 2-4; San Francisco, June 27-29; Chicago, October and Boston, late *November.* Exec. Sec., Dr. John McK. Mitchell, 6 Cushman Road, Rosemont, Pa.

American Board of Physical Medicine and Rehabilitation: *Parts I and II.* Chicago. June 8 and 9. Sec., Dr. Robert L. Bennett, Georgia Warm Springs Foundation, Warm Springs, Ga.

American Board of Plastic Surgery: *Oral and Written.* St. Louis, May 17-19. Sec., Dr. Bradford Cannon, 4647 Pershing Ave., St. Louis 8.

American Board of Proctology. *Part I.* Kansas City, Minneapolis, Philadelphia and San Francisco. May 3. Examination *includes both* oral and written examinations in the basic sciences. *Dates and places tentative.* Sec., Dr. Louis A. Buie, 102-110 2d Ave., S.W., Rochester, Minn.

American Board of Psychiatry and Neurology: Chicago, *June 13-14.* Final date for filing applications was March 15. *New York City*, Dec. 15-16. Final date for filing applications is Sept. 15. Sec.-Treas., Dr. David A. Boyd, Jr., *102-110* Second Ave. S.W., Rochester, Minn.

American Board of Radiology: *Oral.* Spring 1952. Final date for filing *application* was Dec. 31. Sec., Dr. B. R. Kirklin, 102-110 Second Ave., S.W., Rochester, Minn.

American Board of Surgery: *Written.* Various *Centers. October* 1952. Sec., Dr. J. Stewart Rodman, 225 15th St., Philadelphia.

DEATHS

Blakely, Stuart Banyar ⊕ Binghamton, N. Y.; born in New York in 1882; Columbia University College of Physicians and Surgeons, New York, 1908; specialist certified by the American Board of Obstetrics and Gynecology; member of the American Association of Obstetricians, Gynecologists and Abdominal Surgeons; past president of the Binghamton Academy of Medicine and the Broome County Medical Society; fellow of the American College of Surgeons; regional consultant in obstetrics for the state department of health; as chairman of the library committee of the Broome County Medical Society, a position he held from the time of its formation in 1932 until his death, was instrumental in establishing a county medical library; a trustee of the Binghamton Public Library, and Hamilton College Library in Clinton; obstetrician, Binghamton City and Our Lady of Lourdes Memorial hospitals in Binghamton; obstetrical consultant, Tioga County General Hospital in Waverly and Ideal Hospital in Endicott; died in Binghamton City Hospital Feb. 27, aged 70, of mesenteric thrombosis.

Nalle, Brodie Crump Sr., Charlotte, N. C.; born in 1878; University of Virginia Department of Medicine, Charlottesville, 1903; at one time on the faculty of North Carolina Medical College; past president of the North Carolina Obstetrical Society and the Mecklenburg County Medical Society; fellow of the American College of Surgeons; member of the Southern Medical Association, Tri-State Medical Association of the Carolinas and Virginia and the South Atlantic Association of Obstetricians and Gynecologists; specialist certified by the American Board of Obstetrics and Gynecology; one of the founders of the Nalle Clinic, where he was chief of staff; instrumental in the building of the Memorial Hospital, where he was president, first chief of medical staff, and head of the department of obstetrics and gynecology, and where he died Feb. 13, aged 73, of coronary thrombosis.

Gerber, Isaac ⊕ Pawtucket, R. I.; born in 1885; Harvard Medical School, Boston, 1910; specialist certified by the American Board of Radiology; fellow of the American College of Physicians; member of the American Roentgen Ray Society, New England Roentgen Ray Society, of which he had been president, Radiological Society of North America, American College of Radiology, and the American Radium Society; at one time vice president of the Rhode Island Medical Society; consulting radiologist at Butler, Charles V. Chapin, Miriam, Providence Lying-In, Rhode Island, and St. Joseph's hospitals in Providence, South County Hospital in Wakefield, Westerly (R. I.) Hospital, and Woonsocket (R. I.) Hospital; died in Rhode Island Hospital, Providence, Feb. 17, aged 66, of myocardial infarction.

Bell, Albert James ⊕ Cincinnati; born in Cincinnati Aug. 8, 1873; Miami Medical College, Cincinnati, 1899; associate professor of pediatrics at the University of Cincinnati College of Medicine; specialist certified by the American Board of Pediatrics; member of the American Academy of Pediatrics; past president of the Cincinnati Pediatric Society; at one time chairman of the Medical Milk Commission of the Academy of Medicine; in 1941 appointed consulting pediatrician of the city health department; trustee of the Babies' Milk Fund Association; member of the staff of the Cincinnati General Hospital, where he organized and was in charge of the contagious disease department; on the staffs of Christ and Children's hospitals; died in Naples, Fla., Feb. 24, aged 78.

Wall, James Percy ⊕ Jackson, Miss.; born June 25, 1878; Columbia University College of Physicians and Surgeons, New York, 1907; past president of the Mississippi State Medical Association and Central Medical Society; fellow of the American College of Surgeons; at one time vice-president of the Mississippi State Hospital Association; from 1941 to 1951 member of the House of Delegates of the American Medical Association; served during World War I; consulting surgeon, Mississippi State Tuberculosis Sanatorium in Sanatorium; member and formerly secretary of the board of trustees and attending surgeon, Mississippi Baptist Hospital, where he died Feb. 25, aged 73, of coronary thrombosis.

McCannel, Alexander J., Silverton, Ore.; born Jan. 15, 1871; Keokuk Medical College, College of Physicians and Surgeons, 1901; Georgetown University School of Medicine, Washington, D. C., 1906; member of the House of Delegates of the American Medical Association, 1921 and 1924; at one time secretary of the North Dakota State Medical Association and a member of the North Dakota State Board of Medical Examiners; fellow of the American College of Surgeons; served during World War I; formerly practiced in Minot, N. D., where he was a member of the school board; died in Silverton Hospital Feb. 5, aged 81, of uremia, following coronary disease.

Brown, Clyde Olen ⊕ St. Louis; National University of Arts and Sciences Medical Department, St. Louis, 1915; assistant professor of clinical otolaryngology at St. Louis University School of Medicine; member of the American Academy of Ophthalmology and Otolaryngology; specialist certified by the American Board of Otolaryngology; affiliated with Evangelical Deaconess Hospital, Jewish Hospital, St. Luke's Hospital, St. Mary's Infirmary, and Bethesda General Hospital; died in St. Mary's Hospital Feb. 12, aged 62, of coronary thrombosis.

Armen, Garo Hovsepian, Los Angeles; George Washington University School of Medicine, Washington, D. C., 1905; assistant clinical professor of medicine at the University of Southern California School of Medicine; member of the American Medical Association and American Trudeau Society; served on the staffs of Barlow Sanatorium and California Hospital; died Feb. 6, aged 73.

Arnow, Benjamin Hilliard, Van Nuys, Calif.; Long Island College Hospital, Brooklyn, 1925; died in South Gate Feb. 6, aged 52.

Baker, Axcel Conrad ⊕ Fergus Falls, Minn.; University of Minnesota College of Medicine and Surgery, Minneapolis, 1897; Northwestern University Medical School, Chicago, 1901; past president of the Northern Minnesota Medical Association; fellow of the American College of Surgeons; on the staff of the George B. Wright Memorial Hospital; died Dec. 7, aged 77, of cerebral embolism and coronary occlusion.

Barry, Shirley DeVere, Palm Desert, Calif.; Northwestern University Medical School, Chicago, 1905; member of the American Medical Association and Washington State Medical Association; died Jan. 12, aged 71.

Batchelder, Edward Carpenter ⊕ Dover, N. H.; Dartmouth Medical School, Hanover, 1904; fellow of the American College of Surgeons; on the staff of the Wentworth Hospital; died Feb. 4, aged 76, of coronary thrombosis.

Billeter, William John, Bynumville, Mo.; College of Physicians and Surgeons, Keokuk, Iowa, 1887; member of the American Medical Association; served during World War I; died in La Grange Jan. 26, aged 86, of coronary thrombosis.

Blanchard, William Herbert, Assinippi, Mass.; Tufts College Medical School, Boston, 1909; fellow of the American College of Surgeons; formerly on the staffs of the Captain John Adams Hospital and Chelsea Memorial Hospital in Chelsea; served during the Mexican Border campaign and later in France during World War I; died Dec. 26, aged 64.

Boone, George H., Pottsville, Pa.; Hahnemann Medical College and Hospital of Philadelphia, 1894; died in Warne Hospital Feb. 12, aged 80.

Brookshire, Harley Gaskill Sr., Asheville, N. C.; North Carolina Medical College, Davidson, 1905; served as a director of the Aston Park Hospital; died Feb. 7, aged 73.

⊕ Indicates Fellow of the American Medical Association.

Brown, John Robert ⊕ Los Angeles; Western Pennsylvania Medical College, Pittsburgh, 1899; an Associate Fellow of the American Medical Association; formerly practiced in Pittsburgh, where he was affiliated with the Passavant and Southside hospitals and was chief surgeon for the Wabash Railroad; from 1925 to 1951 surgeon for the Hollywood Presbyterian Hospital; died Dec. 27, aged 83.

Buckley, Ralph Emerson ⊕ Conyngham Pass, Pa.; Medico-Chirurgical College of Philadelphia, 1904; an Associate Fellow of the American Medical Association; served in France during World War I and was awarded the Purple Heart; formerly practiced in Hazleton, where he was a member of the board of trustees of the Hazleton State Hospital and president and a member of the board of directors of the Chamber of Commerce; died in St. Joseph Hospital, Hazleton, Feb. 11, aged 69.

Burke, William Patrick, Los Angeles; College of Physicians and Surgeons of Chicago, 1894; died Feb. 16, aged 82.

Burnham, Clark James, Berkeley, Calif.; University of California Medical School, San Francisco, 1891; an Associate Fellow of the American Medical Association; died Feb. 15, aged 83.

Butz, Alfred S., Philadelphia; University of Pennsylvania Department of Medicine, Philadelphia, 1893; also a graduate in pharmacy; died Feb. 11, aged 86.

Caldwell, Spencer Burnham ⊕ Baldwin, N. Y.; University of Vermont College of Medicine, Burlington, 1921; served during World War I; affiliated with Mercy and South Nassau Communities hospitals in Rockville Centre; died Feb. 9, aged 54, of coronary disease.

Casper, Joseph Francis, Jasper, Ind.; University of Louisville (Ky.) School of Medicine, 1910; served during World War I; affiliated with Dubois County Memorial Hospital, where he died Jan. 18, aged 63, of cerebral hemorrhage.

Chapin, Anna Dewey, Los Angeles; the Hahnemann Medical College and Hospital, Chicago, 1902; died Jan. 31, aged 80.

Clements, Henry W., Adel, Ga.; University of Georgia Medical Department, Augusta, 1900; member of the American Medical Association; affiliated with Memorial Hospital, where he died Feb. 6, aged 74.

Crecelius, William Anton, Sandusky, Ohio; Cleveland Homeopathic Medical College, 1898; affiliated with Providence and Good Samaritan hospitals; died Jan. 17, aged 85, of cardiovascular renal disease.

Crum, Edwin Wallace, Waverly, Ill.; Barnes Medical College, St. Louis, 1900; member of the American Medical Association; affiliated with Passavant Memorial and Our Saviour's hospitals in Jacksonville; died in St. Petersburg, Fla., Feb. 13, aged 75, of coronary thrombosis.

Crumpton, Joseph W., Starkville, Miss.; University of Tennessee Medical Department, Nashville, 1883; served on the state board of health and the state house of representatives; twice elected to the state senate; died Feb. 20, aged 92.

Daily, Louis ⊕ Houston, Texas; University of Texas School of Medicine, Galveston, 1910; professor of clinical otolaryngology at the Baylor University College of Medicine; specialist certified by the American Board of Otolaryngology; member of the American Academy of Ophthalmology and Otolaryngology; fellow of the American College of Surgeons; affiliated with Jefferson Davis, Memorial, and Methodist hospitals; died Jan. 29, aged 69, of coronary thrombosis.

Dallas, William Buel, Jefferson City, Mo.; St. Louis College of Physicians and Surgeons, 1923; died Nov. 30, aged 61, of coronary occlusion.

Dancy, Henry Hyman, Phoenixville, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1902; also a pharmacist; died Dec. 18, aged 79.

Daniel, Walter Wright ⊕ Atlanta, Ga.; Emory University School of Medicine, 1923; past president of the Fulton County Medical Society; fellow of the International College of Surgeons; member of the American Academy of General Practice and one of the founders and past president of the Georgia chapter; served overseas during World War I; formerly on the faculty of his alma mater; affiliated with Crawford W. Long Memorial Hospital; died Feb. 24, aged 55, of thrombosis and infarction of the cerebellum.

DeLorme, Homer Arthur, St. Louis; Louisville (Ky.) Medical College, 1892; died Jan. 24, aged 83, of hypertensive heart disease.

Dickson, George Bennett ⊕ Shreveport, La.; Medical Department of Tulane University of Louisiana, New Orleans, 1911; formerly Caddo parish deputy coroner; served during World War I; for many years affiliated with North Louisiana Sanitarium; died Feb. 2, aged 64, of a heart attack.

Dixon, Herbert Sidney, Brooklyn; College of Physicians and Surgeons, medical department of Columbia College, New York, 1892; died Feb. 17, aged 86.

Donnelly, John Devlin ⊕ Bala-Cynwyd, Pa.; University of Pennsylvania School of Medicine, Philadelphia, 1914; specialist certified by the American Board of Pediatrics; past president of the Philadelphia Pediatric Society; served overseas during World War I; affiliated with Misericordia Hospital in Philadelphia and Bryn Mawr (Pa.) Hospital where he died Feb. 9, aged 61, of coronary occlusion.

Eisaman, Cecil LeRoy, Marion, Ind.; Indiana University School of Medicine, Indianapolis, 1925; member of the American Medical Association; served during World War I; died Feb. 10, aged 52.

Elliot, Francis Theodore, Hagerstown, Md.; Jefferson Medical College of Philadelphia, 1911; also a graduate in pharmacy; died Feb. 11, aged 68, of coronary occlusion.

Fleming, John Carl ⊕ Dallas, Pa.; Medico-Chirurgical College of Philadelphia, 1908; specialist certified by the American Board of Otolaryngology; on the staff of the Nesbitt Memorial Hospital in Kingston; died in Methodist Hospital, Philadelphia, Feb. 11, aged 68, of coronary thrombosis.

Fox, Warren Franklin, San Bernardino, Calif.; College of Physicians and Surgeons, Los Angeles, 1913; member of the American Public Health Association; formerly city health officer; died Feb. 19, aged 61.

Gaver, Earl Elbert, Orient, Ohio; Ohio Medical University, Columbus, 1902; veteran of the Spanish-American War and World War I; affiliated with Orient State School, where he died Feb. 24, aged 76, of coronary occlusion.

Gessner, Francis Emil ⊕ Dallas, Texas; Yale University School of Medicine, New Haven, 1912; member of the American Academy of General Practice; for many years member of the city-county welfare board; served during World War I; on the staff of Methodist Hospital; died Feb. 4, aged 61, of a heart attack.

Gilbert, Bernard Horace, San Jose, Calif.; University of Vermont College of Medicine, Burlington, 1913; member of the American Medical Association; died in San Francisco Jan. 23, aged 65, of ruptured abdominal aneurysm.

Gingold, Joseph Randolph ⊕ Meadville, Pa.; Syracuse University College of Medicine, 1923; specialist certified by the American Board of Radiology; member of the Radiological Society of North America and the American College of Radiology; on the staff of Spencer Hospital, where he died Feb. 2, aged 52, of multiple myeloma.

Girsdansky, Joseph, New York; University and Bellevue Hospital Medical College, New York, 1911; member of the American Medical Association; served during World Wars I and II; formerly on the staff of Gouverneur Hospital; died on vacation in Boothbay Harbor, Me., Feb. 14, aged 61, of cerebral hemorrhage.

Goldenberg, Theodore, Buffalo; Hessische Ludwigs-Universität Medizinische Fakultät, Giessen, Hesse, Germany, 1903; member of the American Medical Association; on the staffs of the Millard Fillmore and Lafayette General hospitals; died Feb. 16, aged 71.

GOVERNMENT SERVICES

ARMY

General Raymond A. Kelser Is Dead.—Brig. Gen. Raymond A. Kelser, retired, former chief of the Army Veterinary Corps, died April 16 at his home in Philadelphia, aged 59. General Kelser was a widely known bacteriologist and immunologist. He was commissioned a first lieutenant in the Army Veterinary Corps in 1918, was director of the first army veterinary laboratory at Letterman General Hospital, San Francisco, and for many years commanded the veterinary laboratory section of the Army Medical School in Washington, D. C. During this latter period he was instructor in bacteriology and infectious diseases at the Army Veterinary School and the American University. He was a fellow in bacteriology at Harvard University Medical School in 1933, and later he was a member of the Army Medical Research Board in the Canal Zone. While serving on the Medical Research Board in the Philippines, he developed an improved vaccine that enabled the Philippine Government to erradicate rinderpest from those islands. In 1932 and 1933 he conducted experiments that proved that equine encephalomyelitis, a disease that had killed large numbers of horses in this country, was transmitted by mosquitoes. General Kelser was chairman of the American delegation on the Joint American-Canadian Commission on Rinderpest during World War II. He was appointed chief of the Army Veterinary Corps in 1938, and served in that capacity throughout the war. He was awarded a Ph.D. in 1923 by the American University in Washington, the International Veterinary Congress Prize by the American Veterinary Association, and the degree of Honorary Associate of the Royal College of Veterinary Surgeons in London, and the Army Distinguished Service Medal. General Kelser was buried with full military honors in Arlington National Cemetery in Washington.

Call 265 Reservists to Active Duty.—Two hundred and sixty-five officers of the Army Medical Service Reserve will be ordered into active military service in July, the Department of the Army announced April 11. This is in addition to the original call for 290 officers made in March. Included in the new group are 232 physicians, 25 dentists, and 8 veterinarians. Quotas have been assigned to each of the six Army areas in the continental United States, as well as U. S. Army, Pacific, and U. S. Army Caribbean.

Under the law, priority 1 registrants are defined as those educated at government expense and others deferred from service to pursue a medical or dental education, who spent less than 90 days on active service in World War II following their training. Priority 2 registrants differ only in that they have spent more than 90 days but less than 21 months on active service in World War II following their training. However, the Army is selecting those with the least amount of creditable service first and no one with more than 12 months of previous service will be called. Physicians and veterinarians will continue to be selected entirely from the volunteer reserve, classified as priority 1, but dentists with priority 2 rating will be called. Medical officers selected will be ordered into the active military service for a maximum period of two years.

Preventive Medicine Conference.—Experts of the Army Medical Service and civilian authorities held a 10 day conference in April in Washington on preventive medicine. Representatives of the medical departments of the Navy and Air Force and the chief preventive medicine officer of each Army area in this country and others from Army installations and post hospitals attended. Sessions were conducted in the graduate school at Walter Reed Army Medical Center and included a two day field trip to Camp Detrick, Md. Papers were presented by faculty members of the graduate school and the medical field service school at Fort Sam Houston, Texas, by the preventive medicine division in the Army Surgeon General's Office and by civilian specialists. Sessions were devoted also to atomic and biological warfare, communicable diseases, immunology, chemotherapy, industrial medicine, environmental control and health education, safety, and training.

MISCELLANEOUS

Institute of Civil Aviation Medicine Proposed.—The establishment of an Institute of Civil Aviation Medicine is now a major objective of the Aero Medical Association, it has been announced by Dr. W. R. Stovall, recently installed president. Dr. Stovall, who is chief of the medical division, Office of Aviation Safety, Civil Aeronautics Administration, cites five functions such an institute might perform:

1. It would serve as a focal point for civilian aviation medical activities, containing laboratories for carrying out projects that could not more economically be conducted at universities or other medical laboratories. 2. It would have facilities for resident training of medical examiners to obtain a better understanding of the pilot and his physical demands, and for conducting preliminary extension training courses for physicians who could not conveniently leave their practices for an extended period. 3. It would make possible better field instruction of CAA medical examiners. 4. It would contribute to aviation safety by applying preventive medicine techniques to those human factors which root in physical difficulties. 5. It would concentrate civilian aviation medical needs and activities in a proper atmosphere, permitting studies on civilian aviation medical problems that are not covered by military research and development.

Public concern for every aspect of aviation safety, and the relation of civil aviation problems to the needs of national defense underline the importance of establishing such an institute, Dr. Stovall said. He suggested establishment of the institute at a convenient place such as Indianapolis or Oklahoma City, or at a university that might be able to make its facilities available. The institute would work with outside organizations that are carrying out research contracts on civil aviation medicine.

Dr. Stovall pointed out that the American Advisory Board on Medical Specialties and the American Medical Association's Council on Medical Education and Hospitals delayed granting specialty status to aviation medicine because of the lack of educational and training facilities for civil aviation medical examiners, industrial civil aviation physicians, and other civil flight surgeons.

Number One Killer at Bituminous Coal Mines.—Fifty per cent of all fatalities that occurred underground at bituminous coal and lignite mines in 1951 resulted from falls of roof, face or rib, according to a Bureau of Mines report. The bureau's study reveals that human failure was responsible for 80% of the fatalities and unforeseeable dangers and unavoidable risks for 20%.

Management failure was responsible for 50% of the human-failure fatalities, employee failure accounted for 23%, and joint or undetermined human failure for 7%. However, "Many managers," the report states, "have made such determined efforts toward eliminating the roof-fall menace that their mines have been operated for long periods of time without a fatality. Also, many miners have treated the mine roof with a respect that has allowed them to work 30, 40 or even 50 years without being injured." The average dimensions of the pieces of roof-rock that fell and caused fatalities were 13 ft. long, 10 ft. wide and 1 ft. in maximum thickness. The comparatively large area of these falls emphasized the great need for better roof control standards and strict compliance therewith by both officials and workmen.

Forty-eight per cent of the fatalities occurred in places where coal was loaded mechanically, and the remaining 52% occurred in hand-loading places. Forty (14%) of the 292 fatalities occurred while the foremen were in the places where the falls occurred; they include those cases where the foreman was a victim. In numerous other instances, the fall occurred within minutes after the foreman had visited the place. This indicates that some foremen are unaware of all unsafe conditions or measures that should be taken, or they place production ahead of safety. The report contains recommendations designed to reduce the number of roof-fall fatalities. A free copy of HHS 406, "Falls of Roof The No. 1 Killer at Bituminous Coal Mines 1951," by T. L. Back and H. F. Weaver, can be obtained from the Bureau of Mines, 4800 Forbes St., Pittsburgh 13.

FOREIGN LETTERS

DENMARK

Private Practitioner or Government Specialist?—In a lecture delivered to the Irish Academy of Medicine in November, 1951, Dr. Johannes Frandsen, director-general of the Danish Health Service, traced the evolution of this service during the last few years and drew attention to the difficulties encountered in coordinating health activities. A new medical field has been created in the last 10 years, and it was suggested that an activity such as wholesale diphtheria immunization could be more cheaply and, perhaps, more effectively carried out by young physicians and nurses than by general practitioners. It was also suggested that pediatricians be appointed to examine children. But Dr. Frandsen had no doubt that the newly created medical work belonged by right to the general practitioner and that it was imperative to use his knowledge and energy in any public health service. "If you push him aside and deprive him not only of the work but also of the chance of earning something, first in one field and then in another, the result will be a disillusioned hard-up profession; and an impecunious doctor who has lost courage and who cannot afford to keep his medical knowledge abreast of the times is apt to be both dangerous and costly to society."

Turning to the special field of tuberculosis, Dr. Frandsen pointed out the need for adapting antituberculosis measures to the special needs and conditions of different countries. It cannot be assumed that "the fight against tuberculosis can be conducted according to one universal, international plan." In each county in Denmark there is now a dispensary system with a tuberculosis hospital at the center, its director being in charge of both hospital and dispensary. Half of the cost of the dispensaries is refunded by the state. Tuberculosis is diminishing so rapidly in Denmark that some tuberculosis institutions may soon have to be diverted to other uses. The dispensaries will, however, continue to function for a long time to come, and the maintenance of BCG immunization, now general throughout the country, will be assured. Both BCG and diphtheria immunization are provided free of charge. In 1950, there were only 14 deaths per 100,000 persons from all forms of tuberculosis, a remarkable fall from 78 per 100,000 deaths in 1927. Denmark's freedom from bovine tuberculosis at the present time is largely to be credited to the Federation of Danish Dairy Organizations.

Dr. Frandsen's account of the Danish hospital system emphasized the importance of the part played by the private general practitioner. There are now 10.4 hospital beds of every description per 1,000 inhabitants. Each county has at least one large central hospital as well as several smaller hospitals, each with 50 to 100 beds in the charge of a surgeon. "If we are to improve our hospital system and keep it abreast of medical progress, it is essential for financial reasons to take care that the hospitals do not grow bigger and treat more patients than is necessary." To this end efforts are made to provide the almost 2,500 well-trained general practitioners with facilities for laboratory tests and specialist examinations, so that as many patients as possible can be treated at home. Most of the central hospitals are now equipped with laboratories in which investigations can be undertaken on behalf of general practitioners.

Dr. Frandsen also referred to the successful experiment carried out with the help of the Rockefeller Foundation in combatting a comparatively high infant mortality. During this 6-year experiment nurses visited homes and taught mothers how to care for their children during the first year of life. This experiment was carried out in two rural districts and in a Copenhagen slum. The infant mortality in the selected districts was halved. An act extending this work was quickly passed and became a turning point in Danish health legislation, for it was the first law aimed at preserving the health of healthy persons. More than half of the children in Denmark are now under the regular supervision of a health nurse. Since 1945, preventive health legislation has been extended to expectant mothers, who now have the right during pregnancy to be examined three times by a doctor and seven times by a midwife. These and many other free examinations are offered to children from birth onwards, regardless of their social standing.

ACTH and Cortisone for Diseases of the Eyes.—At a recent meeting of the Ophthalmological Society in Copenhagen, Dr. Elise Vesterdal gave an account of the treatment with corticotropin (ACTH) or cortisone of 111 patients suffering from diseases of the eyes. This treatment was started in June, 1950, and since then considerable experience with it has been acquired at the eye department of the Rigshospital, where 45 patients have been given inpatient treatment. Most of the other patients were ambulatory cases treated at the Eye Polyclinic. In 52 cases only corticotropin treatment was given and in 33 cases only cortisone, while in 26 cases both preparations were given either simultaneously or consecutively. In every case the observation period lasted more than two months.

The opinion Dr. Vesterdal has formed of the value of this treatment is guarded, yet at the same time most favorable. During observation periods ranging from 3 to 15 years she found that cortisone given locally was highly effective in various diseases of the eye, including allergic conjunctivitis with palpebral eczema, nodular episcleritis, sclerokeratitis, acne rosacea keratitis, parenchymatous keratitis (metaherpetic as well as syphilitic), and mild cases of acute iritis. In some cases of inflammation of the posterior segment of the eye, such as iridocyclitis, treatment with corticotropin was dramatically effective. No significant or permanent ill-effects were observed after the parenteral administration of corticotropin, and the local administration of cortisone did not produce any side-effects whatever. Even though it may seem that the action of these preparations is merely symptomatic, without the radical removal of the original causal factors and without any guarantee against ultimate relapse, it has so many advantages over other methods of treatment that its adoption in ophthalmology is fully justified as a matter of everyday practice in conjunction with more directly causal therapeutic measures. Indeed, it may be said that at the present time the greatest enthusiasm exists with regard to the purely therapeutic effects of corticotropin and cortisone in ophthalmology. Among the many reasons for this enthusiasm is the comparative cheapness with which these expensive preparations can be given in ophthalmologic practice. Another great advantage is the absence of those complicating ill-effects, which these preparations have provoked when given in comparatively large doses for diseases in other parts of the body.

MEXICO

Reorganization of Mexico City General Hospital.—In 1905, Mexico City, with a population of 500,000, dedicated the municipal general hospital, which had a capacity of 1,000 beds. The General Hospital of Mexico City soon became the most important clinical institution in the country and one of the best in Latin America. The school of medicine taught most of the different services, and its staff included members of international prestige: Dr. Fernando López, Dr. José Terrés, Dr. Angel Gaviño, and Dr. Genaro Escalona, among others. The cardiology department, of which Prof. Ignacio Chavez was the head, included most of the investigators who later became chiefs and senior members of the departments of the Instituto Nacional de Cardiología, when this institution was founded in 1944. The department of internal medicine constituted the nucleus on which the Hospital de Enfermedades de la Nutricion was created in 1946.

But by the late thirties it was clear that the capacity of the general hospital was inadequate to accommodate the growing population of Mexico City (3,000,000 in 1950) and that the distribution of its services and departments, in more than 50

The items in these letters are contributed by regular correspondents in the various foreign countries.

separate buildings, was not functional. Such problems became acute in the last years, during which the medical and nosocomial standards of the institution were not as high as they had been. Nevertheless, until Mexico City builds a new modern general hospital, the present institution is indispensable. With several excellent services and departments still functioning, some months ago the medical staff began to study and act on plans for a temporary reorganization. Dr. Mariano Vázquez, chief of one of the surgical services for more than 20 years, was chosen medical director last January. Owing to his personal qualities, the cooperation of the medical staff, and financial help from the federal government, it is expected that a substantial improvement will take place at the general hospital. Meanwhile, a better institution is being planned.

Anniversary of Professor Cosío-Villegas.—In Mexico, where there are still around 300,000 patients with tuberculosis, phthisiology is a specialty of considerable importance. Prof. Ismael Cosío-Villegas has been responsible in great part for the development of this branch of medicine in this country.

In 1929, with the advice of Professor Gea-González and at the request of the federal sanitary authorities, he planned the Campaña Nacional contra la Tuberculosis (National Campaign Against Tuberculosis), a vast and accomplished organization. Professor Cosío-Villegas has been chief not only on that occasion but again in 1938 and in 1945. It was in that capacity that he created the first tuberculosis hospitals and dispensaries, and in order to provide medical staffs for them he organized, for the first time, postgraduate studies in phthisiology, which have continued to be given every year since. Now there are four tuberculosis hospitals (average capacity: 600 beds), two in Mexico City, one near the Gulf of Mexico, and the other in Guadalajara, which is the second largest city of the country. A brilliant expositor, Professor Cosío-Villegas has occupied one of the chairs of clinical medicine at the school of medicine and has participated in numerous scientific meetings, national and foreign; he was chairman of the Eighth Pan-American Congress of Phthisiology, which was held in January, 1949. He has written more than 100 papers and communications and is the author of an excellent textbook of pneumology.

Last January, on the occasion of the 25th professional anniversary of Professor Cosío-Villegas, several events took place to honor him. There were three medical meetings, during which 48 papers were read and commented on by Professor Cosío-Villegas' friends, pupils, and collaborators, and which made an appraisal of the present status of Mexican phthisiology. All of them will be included in a commemorative volume, which will be published this year.

PARIS

New Treatment of Leprosy.—Professor Gaté (Lyons) reported the preliminary results of treating leprosy with bi-dihydrochaulmoogroyl-4,4′ diamino-diphenyl-sulfone, a combination of chaulmoogra oil and diamino-diphenyl-sulfone (D. D. S.) radicals. The drug was developed by M. Chambon, professor of organic chemistry and toxicology (Lyons), who previously prepared delactonized and selectively hydrogenized chaulmoogra oil, whose low toxicity and intramuscular and intradermic diffusibility has permitted, since 1949, prolonged treatment with large doses, at the Lyons leprosary. Diamino-diphenyl-sulfone has an unquestionably beneficial effect on leprosy, but it is poorly tolerated by aged patients.

It is used as a 5% suspension. Each series of injections consists of 2 deep intramuscular injections of 10 cc. per week for a total of 20 injections, 15 days intervening between each series. Preliminary trials on 17 patients from 10 to 73 years of age resulted in clinical improvement of all types of leprosy. Leprids were always favorably influenced early; after attentuation of their color and progressive diminution of their size, the skin resumed its normal appearance or retained only a yellowish or light brown pigmentation. Moreover, lepromas disappeared rapidly; in a 70-year-old woman, whose lepromas did not totally disappear after oral administration of sulfones and who tolerated diamino-diphenyl-sulfone badly, the new remedy brought about complete deflation of the lepromas, together with clearing of the pigmented spots, under which there was no more infiltration. In a case of ulcerous leprosy, lepromas of the face disappeared before the conclusion of the first series of injections; after the sixth injection, the cicatrising of ulceration was already in progress. Moreover, two patients with ocular lesions with iritis, one with free lepromas in the vitreous humor and the other with corneal lepromas, could be treated without the undesirable sulfones. In nerve lesions, the alleviation of pain and the diminution of the hypertrophy of the nervous trunks as well as arrest of atrophy occurred rapidly. Histological results are encouraging; along with the reduction of Hansen's bacilli, which often became granular, a lymphocytic reaction and a modification of infiltration were noted. Local and general tolerances were excellent, even in the patient who tolerated orally administered sulfones poorly. There were no contraindications because of age, general condition, or coexisting disease.

Severe Shock by Vitamin B_1.—Benmussa and Diacono (Tunis) have just reported a severe case of true shock with collapse occurring in a 57-year-old physician who received a daily injection of 100 mg. of thiamine hydrochloride for sciatic neuralgia. The first four injections were well tolerated; three minutes after the fifth injection, he experienced malaise, screamed, vomited, and collapsed. A few moments later, examination revealed the complete abolition of all reflexes, a comatose appearance, intensive congestion, with cyanosis, loss of consciousness, abolition of radical pulse, heart sounds that were barely perceptible because of noisy respiration, and a lowering of the arterial blood pressure. The patient remained in this condition during the entire night, during which two intestinal hemorrhages occurred, one hour apart. Ten hours after the onset of the accident, a hemogram was performed, which revealed marked hemoconcentration. In order to relieve the shock, a massive transfusion, by perfusion, of 500 cc. of diluted blood, at the rate of 140 to 160 drops per minute, was instituted, and this was alternated with 500 cc. of polyvinyl-pyrrolidone "subtosan." After injection of a liter of fluid, improvement was spectacular; the pulse became intermittently perceptible; and after 1,500 cc. of total fluid was administered the heart was beating regularly (88 beats per minute). After 1,700 cc. was administerd (1,000 cc. of diluted blood and 700 cc. of polyvinyl-pyrrolidone), transfusion was discontinued. After a quiet night, improvement progressed rapidly; on the following day the patient felt normal and was euphoric. He resumed his activities after a rest of five days.

***p*-Aminosalicylic Acid in Pulmonary Tuberculosis.**—In order to obtain an adequate blood level of *p*-aminosalicylic acid (PAS) over an extended period, large doses must be given orally, but this can rarely be done, because of the appearance of digestive disorders. Intravenous administration gives adequate levels, but the rapid elimination of the drug necessitates continuous perfusion. A pure, pyrogen-free solute of *p*-aminosalicylic acid has been developed and used for over a year by Paraf and Zivy and their associates in the pharmacy laboratory of the Bichat Hospital. A quantity of 500 cc. of this solution, containing 15 gm. of *p*-aminosalicylic acid, is perfused by drip for two and a half to three hours. The blood concentration shows high peaks, which favors passage of the drug through the fibrous and vascular barriers; perfusions may be administered for one or two months without inconvenience. Results are interesting, especially in patients with cavitary tuberculosis, in whom streptomycin and *p*-aminosalicylic acid administered orally are ineffective. Of the 40 patients treated, there was noticeable improvement in 88%. The field of collapsotherapy was widened, a pneumothorax often being made possible by the perfusions. In 10 to 15% of the patients, perfusions of *p*-aminosalicylic acid seem to be ineffective, but combination with streptomycin reduces the number of failures. The authors also stressed that these perfusions with streptomycin resulted in 42 patients with cases of recent acute meningitis, in complete recovery in 76.2%. This recovery, which has lasted 18 months thus far, has permitted the resumption of scholastic and professional activities. Even in 21 patients with long-standing cases, when streptomycin was insufficient or had become ineffective, perfusion of *p*-aminosalicylic acid resulted in complete recovery in 5 patients (which has now lasted 18 months); 5 patients are in good condition; 3 have not done well, and 9 have died. Recently, Paraf reported that when intravenous perfusions in children are not possible, subcutaneous perfusion may be performed.

Treatment of Lipoid Nephrosis with ACTH.—On Nov. 23, 1951, at a meeting of the Medical Society of the Paris Hospitals, Professor Debré and Drs. P. Mozziconacci, Attal, and Caramanian discussed results of corticotropin therapy in 17 cases of pure lipoid nephrosis, without nephritis, important azotemia, or noticeable hypertension, which constitute a contraindication for this treatment. The 17 cases treated resulted in four complete successes, nine partial successes, and four failures. They gave from 50 to 75 mg. of corticotropin daily for 8 to 10 days. Forty-eight hours after completion of the treatment, an outbreak of diuresis of 2 to 3 liters occurred, which lasted 24 hours and was followed by a rapid "melting away" of edema. If this outbreak occurs during the course of the treatment, treatment may be interrupted immediately. The effect on the blood syndrome is less certain. Professor Debré and his co-workers emphasized that corticotropin does not constitute a specific treatment of lipoid nephrosis, and also that there is not sufficient time elapsed to determine in what degree its effect on the edema contributes to the cure of the disease. They noted the total failure of cortisone in the treatment of lipoid nephrosis. They also frequently observed that dehydration occurred during treatment. In such cases they recommend the discontinuation of the salt-free diet after cessation of corticotropin and resumption of a low chloride diet. They stressed at the same time the necessity of a strictly salt-free diet during corticotropin treatment in order to avoid acute edematous accidents. Several other authors (Prof. Julien Marie in 10 cases, Azerard in 2, Derot in 2, and Clement in 2) noted the same results. Professor Marie stated that one relapse occurred during the months following the treatment.

SPAIN

Congress of Surgery.—The Third International Congress of Surgery will take place in Madrid from May 19 to May 24. The following subjects will be discussed: (1) surgery of vesical tumors, by Professors R. Darget (Burdeos), Boeminghaus (Duesseldorf), Gil Vernet (Barcelona), O. S. Lowsley (New York), R. Freitas (Sao Paulo), and Oheeron (Texas); (2) hip surgery, by Professors Brittain (Norwich), Judet (Paris), Rodriguez de Mata (Madrid), R. Anderson (Washington), E. Compere (Chicago), and Montagne (Lima); and (3) cardiovascular surgery, by Professors Valdoni (Rome), Derra (Duesseldorf), Piulachs (Barcelona), Taiana (Buenos Aires), Bailey (Philadelphia), and A. Ochsner (New Orleans).

The organization committee of the congress is headed by Prof. Martin Lagos (faculty of medicine of Madrid), and the vice-presidents are Professors Garcia Orcoyen (dean of the faculty of medicine of Madrid), A. De La Peña (professor of urology of the faculty of medicine of Madrid), and J. Soler Roig (Barcelona). The secretary general of the congress is Professor A. De La Fuente (professor of surgery of the faculty of medicine of Madrid). The presiding officer of the section on communications is Dr. M. Merchan (assistant professor of surgery of the faculty of medicine of Madrid).

Inquiries should be addressed to the Instituto Nacional de Medicina y Seguridad del Trabajo, Facultad de Medicina, Pabellón Núm. 8, Ciudad Universitaria, Madrid, in the name of the secretary general of the congress mentioned above.

SWITZERLAND

Danger to Freedom of Practice of Medicine.—There has been in Switzerland, since 1911, a law regarding insurance against illness and accident; this law is supposed to protect the poor who must be members of a mutual benefit society. For many years, since only poor persons were members of the sick-fund, the Swiss physicians charged a low rate ($0.75) for consultation, in spite of the increased cost of living. In the German part of Switzerland, the sick-funds became increasingly powerful and obliged all physicians to sign agreements with them. Then, little by little, middle class and wealthy persons were accepted in the sick-fund and could have the benefit of treatments at the same rate as the poorer persons. The physicians of the French part of Switzerland always refused to sign such arrangements with the sick-funds; they compromised, and the physician would charge his patient according to his economic status. The patient could obtain from the sick-fund the repayment of $0.75, paying the difference to the practitioner. This modus vivendi was criticized by the sick-funds, which reasoned that when the patients regularly pay their assessment to the sick-fund they should be treated according to the law on insurance against illness and accidents, which guarantees them the application by the physician of the maximum rate. Two arguments can be opposed to this opinion and cancel it. The law, dating from 1911, was made only for persons of low financial condition in order to assure them of treatments at a low price, while, in 1948, 65% of the Swiss population were members of sick-funds. Chiefly, the rates that were suitable in 1911 are far too low at the present time.

The Swiss government, stimulated by the sick-funds, which wield political power, made an arbitrary decision on July 20, 1951, which obliged the physician to treat all members of the sick-funds at the maximum rates ordered by the law. If the patient agreed to pay more than the maximum rate in order to help the physician defray the increased cost of living, the sick-fund is not allowed to repay him the amount that he is supposed to receive according to his right. Thus, the physician can either refuse to treat the insured persons (this if still possible according to the law) or to treat them, but only at the rate of the sick-fund. The insured is injured too; this governmental decree is a hindrance to his liberty in choosing his physician, for he is obliged to consult only practitioners who have signed the agreement with the sick-funds; he cannot thus have the attendance of specialists who refuse to accept the maximum rates, unless they themselves pay the whole amount of the consultation. The Federation of the Swiss Physicians made an energetic protest against this decree at an extraordinary general meeting last summer.

Just after this decree, much criticized also by the Swiss Society of Jurists, was issued, a second one, even more arbitrary, was formulated by the ministry of public economy of Switzerland toward the physicians of Geneva. These practitioners, although they had not signed any agreement with the sick-funds, are obliged to accept a fee of $1.00 for a consultation and of $1.33 for a visit at the house of the patient; this decree was taken on the advice of the "Office fédéral de contrôle des prix," which is supposed to fight against the increased cost of living. These fees were based on those charged by physicians of Geneva before 1939 for the members of sick-funds who were poor; thus a fee that was minimal in 1939 would be maximal for 1952.

Swiss physicians insist on the division of the persons insured in different categories: (1) the poor class with legal minimum scale of price; (2) persons with average incomes for whom the legal maximum scale will be charged without being exceeded, and (3) wealthy persons with free scales of price, who can obtain a repayment of a part of the fees they pay to the physician. This seems to be the only way of compromising with the sick-funds.

There is another problem facing the patients. The "Concordat des caisses-maladie" of Switzerland established, about 20 years ago, an official list of pharmaceutical products, which are the only ones that can be prescribed to the insured persons of sick-funds; every 2 or 3 years, this list is renewed in order to follow the progress of therapeutics. This list is approved by a commission of medical experts who do not have enough time to thoroughly study the propositions made by the direction of the sick-funds. It becomes obligatory for the physician to prescribe a remedy from the list; otherwise it is the patient who has to pay for it. Since only persons without medical information deal with the applications of the list, it has often happened that urgent treatments with penicillin, streptomycin, or chloramphenicol could not be fulfilled because the sick-fund did not accept it. The list in question is set without any scientific criterion, and the directors of different pharmaceutical firms have made protestations against it, for their products, though excellent, were not accepted for this list, not having had the agreement of the heads of the sick-funds. The patients suffer very much from this, as they cannot have the benefit of some efficient therapeutics unless they pay for it themselves; the physicians are wronged in that they cannnot prescribe the treatment they would judge the most judicious.

CORRESPONDENCE

POLLEN PREVALENCE AND POLLEN-FREE AREAS

To the Editor:—I have read with interest the article entitled "Pollen Prevalence and Pollen-Free Areas" by Orin C. Durham, which appeared in The Journal (**148:**716 [March 1] 1952). Mr. Durham's approach to the pollen problem may perpetuate a fallacy in the mind of the average physician reader. There is an implication first, that it is possible to escape a pollen allergy and second, that there are certain areas, suggested by the accompanying maps, to which a pollen sensitive person may flee.

In the first instance, a basic tenet of the field of allergy states that it is the predisposition to become sensitized rather than the sensitizing agent that controls the fate of the allergic person. Experience in Southern California demonstrates this with monotonous regularity. A person sensitive to eastern pollen who moves to this area will probably become sensitized to our local flora within a period of from 6 to 18 months. This new sensitivity is as strong and the symptoms often as intense as they were when the person lived in the East. Some of these persons moved here because of the type of advice that Mr. Durham's article suggests.

I do not wish to criticize Mr. Durham's excellent observations. He properly offers no clinical advice, but I believe that the article almost demands that the reader draw conclusions that are frequently erroneous and can lead to considerable economic and social dislocation for those who heed such advice, pack up their worldy goods and head for the pollen-free open spaces where ragweed is no more. Unless such articles as this are confined to specialized journals or guarded by proper caution to the overzealous reader, both article and author become the victims of unfortunate misinterpretation. Author, reader, and patient are the losers thereby.

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ANTABUSE®-ALCOHOL REACTION FOLLOWING USE OF AFTER-SHAVE LOTION

To the Editor:—In October, 1951, tetraethylthiuramdisulfide (antabuse®) was approved for sale on physicians' prescription as a useful adjunct in the treatment of alcoholism. Prior to this time, controlled investigations of the drug were made in the United States and Canada in selected clinics and institutions. Since it is anticipated that the drug will be widely used, the following experiences are reported as indicative of some of the cautions that must be exercised in treating patients with this drug.

Two hospitalized patients were started simultaneously on tetraethylthiuramdisulfide therapy after the usual precautions concerning evaluation of cardiac and liver function. The dosage given was 0.5 gm. daily for two weeks. At the end of this period the patients were given 15 cc. of 100-proof whiskey by mouth, which was swallowed rapidly. Fifteen minutes later, patients were permitted to sip another 15 cc. of 100-proof whiskey. In each case, with the second drink of whiskey, the anticipated reaction of flushing of the face, scleral injection, tachycardia, sense of constriction of the throat, and nausea were observed. After this initial conditioning test, both patients were given a reduced dose of 0.25 gm. of the drug daily. On the second day of reduced dosage, each patient applied an after-shave lotion, containing approximately 50% alcohol, to the face after shaving. Within five minutes, both patients experienced warmth and flushing of the face, with areas of blotching, waves of nausea, and the typical apprehension of a mild tetraethylthiuramdisulfide-alcohol reaction. Although the reaction was not severe, it was more dramatic than the controlled alcohol test because it was totally unexpected and in each of the instances served to reinforce the experience of the incompatibility of the drug and alcohol.

Tests were made to determine whether this reaction to after-shave lotion was due to alcohol being absorbed through the skin or to the absorption of alcoholic vapor by the mucous membranes. The abdomen was sponged freely with 70% alcohol as in preparation for surgery. While this was being done, the patients compressed their nares to prevent the contact of the alcohol vapor with the mucous membrane of the nasal passages. Within five minutes, both patients experienced a very mild, transient sensation of warmth of the face. No other symptoms developed. Later, the patients were asked to drip 70% alcohol on their hands, place their hands close to the nares and inhale. Within five minutes, a definite sensation of warmth of the face, some general perspiration, and some scleral injection developed. The reaction persisted for about 10 minutes, and both patients agreed that the reaction was increased by the smell of alcohol. It would appear, therefore, that the mechanism of this mild reaction is due primarily to absorption of alcohol vapor rather than to any appreciable absorption through the skin.

This clinical experience is being reported because it is believed that a similar mild tetraethylthiuramdisulfide-alcohol reaction could be produced by other commercially used products, such as hair tonics or cosmetic preparations. The mild reaction produced may be salutary as a reinforcement of the conditioning; on the other hand, it is possible that in certain situations such a reaction could cause considerable embarrassment and discouragement in a person who is finding it difficult to face his problems without the use of alcohol.

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TROPHIC VS. TROPIC

To the Editor:—Although I have not noticed "trophic" and "tropic" used incorrectly in The Journal, I would like to point out that they are often misused. Would it not be possible to have a unified nomenclature in using the respective terms? In articles dealing with female endocrinology one often encounters the expressions "gonadotrophic" or "luteotrophic" hormone. It has never occurred to most of the authors that this is a misnomer. They derive the second part of the words in question from the Greek *trephein,* which means to feed or to nourish. This appears in expressions like "atrophy or atrophic" or "hypertrophic," where it simply means that a certain part is either undernourished or overnourished; however, the words I am speaking of should read "gonadotropic or luteotropic," since these words are derived from the Greek *trepein,* which means to drive, change, or turn into. Therefore, it is understood that the pituitary gland producing these hormones does not "nourish" the ovary but that its hormones induce a change of the ovarian structure, namely, either follicle formation or transformation of the ruptured follicle into a corpus luteum.

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CANCER OF THE LUNG AND CIGARETTES

To the Editor:—In my article on bronchogenic carcinoma in The Journal (**148:**691 [March 1] 1952), I regret that I misquoted from Doll and Hill's report in the *British Medical Journal* (**2:**739, 1950) concerning the number of cigarettes smoked by patients with cancer of the lung. Instead of the statement "11.6% [of a series of patients with cancer of the lung] smoked 500,000 cigarettes or more a year," it should be that "7.6% of patients with cancer of the lung have smoked more than 500,000 cigarettes up to the time of the discovery of the cancer."

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BUREAU OF LEGAL MEDICINE AND LEGISLATION

MEDICOLEGAL ABSTRACTS

Evidence: Need for Physician Expert Witness to Be Licensed in State.—The plaintiff sued for damages resulting from an automobile collision. From a judgment in favor of the plaintiff, the defendant appealed to the Supreme Court of Wisconsin.

One of the physicians whom the plaintiff consulted was a resident and licensed practitioner in the State of Minnesota, but not in Wisconsin. The Wisconsin medical practice act provides that a person who is not licensed to practice in the State shall not testify in a professional capacity as a physician. The defendant therefore contended that this physician's testimony should not have been admitted in evidence. Another section of the medical practice act, however, excepts from its provisions physicians of other states in actual consultation with resident licensed practitioners of the State of Wisconsin.

It is true, said the Supreme Court, that Dr. Thorsen was engaged in practice in St. Paul, Minnesota and was not licensed to practice in Wisconsin, but it does appear that Dr. Ihle, who was treating the plaintiff, is licensed to practice in Wisconsin, and that he sought the assistance of Dr. Thorsen when he determined that his patient needed the attention of one engaged in Dr. Thorsen's specialty. A complete history of the patient's condition was sent to Dr. Thorsen when the arrangement was made under the advice of her physician for her to consult him. That physician, in this exchange made for the assistance of Dr. Ihle in treating the plaintiff, thus became a consultant. Dr. Thorsen treated the patient. He saw her at the Miller Hospital in St. Paul over a period of a week, prescribed for her, and gave her psychiatric treatments. There was a discussion of the case by him with Dr. Ihle, who was her Wisconsin physician at the time. The discussions were over the phone and in letters. As we have said, the patient was referred to Dr. Thorsen, by a competent qualified Wisconsin licensed practicing physician to whom Dr. Thorsen reported and with whom he consulted. The Supreme Court, therefore, concluded that the trial court properly, in the exercise of its discretion, admitted the evidence of Dr. Thorsen.

For other reasons, however, the judgment in favor of the plaintiff was reversed and the case remanded for a new trial.—*Landrath v. Allstate Ins. Co., 48 N. W. (2d) 485 (Wisconsin 1951).*

Hospitals for Profit: Liability of Physician-Owner.—The plaintiff sued for damages for injuries alleged to have been caused by the negligence of the defendant's agents, servants, and employees. From a judgment in favor of the defendant, the plaintiff appealed to the Supreme Court of Oklahoma.

The hospital in question was originally owned by the city of Altus, but, some time prior to the plaintiff's injury, the city leased the hospital to the defendant physician, who has since been operating, equipping, and managing it. The hospital is what is known as an "open staff" hospital, any licensed physician living within a reasonable distance of Altus being permitted to take his patients there for treatment. The defendant employs and staffs the hospital with nurses to assist the physicians in administering treatment to their patients. The plaintiff was suffering from an ailment that she was told by her physician, Dr. Ensey, was rheumatoid arthritis and was placed by him in the defendant's hospital for treatment. The plaintiff was given a heat wave treatment by means of a diathermy machine. Dr. Ensey, the plaintiff's physician, with the assistance of nurses furnished by the defendant, applied the heat to her back and set the dial at 250 ma. of current. He then left the hospital and instructed the nurse to cut off the heat in 20 minutes. At the same time, another nurse appeared to relieve this nurse and she was advised of the physician's instructions and told to disconnect the heat within 20 minutes. This nurse testified that she did within 20 minutes thereafter discontinue the heat. The plaintiff testified that, as the result of this treatment, her back and arm were severely burned. The contention of the plaintiff is that Dr. Ensey and the nurses who assisted him were agents, servants, and employees of the defendant.

We do not agree, said the Supreme Court. The undisputed evidence shows that Dr. Ensey applied the heat and directed the length of time it should remain applied. Assuming that the jury might have found under the evidence that the heat was applied at too great a degree of temperature, still, the defendant would not have been liable for Dr. Ensey's negligent act in so doing. The evidence shows without dispute that the relationship of physician and patient was created between Dr. Ensey and the plaintiff. Dr. Ensey was acting on his own account as a physician in prescribing and giving such treatment. He was not acting as an agent, servant, or employee of the defendant lessee nor was he acting under his control and direction. The defendant is, therefore, not liable for the negligence, if any, of Dr. Ensey in administering such treatment.

It is further contended by the plaintiff that the nurse in charge was guilty of negligence in not removing the pad from the plaintiff's back and discontinuing the heat application at the proper time and that, since the physician had then departed from the hospital, the nurse in charge was no longer under his direction, control, and supervision but was then acting as a general employee of the defendant under his supervision, direction, and control, and her negligence in failing to discontinue the heat treatment is chargeable to him. The evidence shows without dispute that the nurse, in doing what she did, was following strictly the directions of Dr. Ensey, the attending physician, and without any act of negligence on her part. If the heat was applied for too great a length of time it was because of negligence of Dr. Ensey in giving his instructions to the nurse and not because of any independent act of negligence on her part after the physician left the hospital. The defendant is not chargeable with Dr. Ensey's negligence. Accordingly, the judgment of the trial court in favor of the defendant physician was affirmed. *Van Cleave v. Irby, 233 P. (2d) 963 (Oklahoma, 1951).*

MEDICAL MOTION PICTURES

Oxygen Dosage and Technics: 16 mm., color, sound, showing time 28 minutes. Produced in 1951 by Audio Productions, Inc., 630 Ninth Avenue, New York 19, New York. Procurable on loan from Linde Air Products Company, 30 East 42nd St., New York 17.

This film demonstrates the application of various devices for use in the administration of oxygen. It shows oxygen piped in a hospital and delivered in cylinders and the use of pressure reducing valves in various types of inhalation apparatus. It pictures a tent using a large canopy covering the entire mattress, incubators, the use of various face masks, positive pressure masks, the nasal catheter, hoods, and even improvised funnels, bags, and gadgets to administer oxygen. The emphasis is on the administration of oxygen rather than on the medical indications for its use, although there is some mention as to what conditions are best treated by this method. One section shows the use of helium and oxygen for obstructions in breathing.

A great many facts, devices, and tricks in operation have been compressed into this short informative film; however, some details are omitted that would benefit personnel unfamiliar with the use of oxygen. For example, there is no mention made of the danger of inserting the catheter too far or not far enough. Mention is made of the necessity for analyzing oxygen content under hoods and tents. The film demonstrates this being done with a Beckman Analyzer. A classroom demonstration technique was used rather than actual patients. The photography, the selection of subjects, and the selection and display of apparatus are all well planned and executed. The film is recommended for use by anyone interested in the proper application of oxygen therapy whether at the [illegible]led or unskilled level. It does not pertain to medical ju[illegible] on the use [illegible]gen. It is a film on the technique o[illegible] of oxygen. [illegible]ld be shown to all nur[illegible]

MEDICAL LITERATURE ABSTRACTS

UNITED STATES

A.M.A. Am. Journal Diseases Child., Chicago

83:151-270 (Feb.) 1952

Differential Diagnosis of Oligophrenia. R. Gibson.—p. 151.
*Physiological Knock-Knee. T. V. Geppert.—p. 154.
Chronic Panniculitis with Leucopenia (Weber-Christian Syndrome). H. N. Sanford, D. F. Eubank and F. Stenn.—p. 156.
Organic-Aciduria, Decreased Renal Ammonia Production, Hydrophthalmos, and Mental Retardation: Clinical Entity. C. U. Lowe, M. Terrey and E. A. MacLachlan.—p. 164.
Renal Function Studies in Pediatrics: I. Renal Hemodynamics in Children with Sickle Cell Anemia. J. N. Etteldorf, A. H. Tuttle and G. W. Clayton.—p. 185.
Diarrhea of the Newborn: Report of Epidemic and Results of Treatment with Streptomycin. R. B. Scott, G. P. Brown and A. D. Kessler. —p. 192.
Ehlers-Danlos Syndrome: Report of Case with Suggestion of Possible Causal Mechanism. A. Kanof.—p. 197.
Early Descriptions of Congenital Pyloric Stenosis. H. R. E. Wallis. —p. 203.

Physiological Knock Knee.—The high incidence of knock knee between the ages of 1 and 6 years induced Geppert to investigate whether and to what extent knock knee is physiological in children at this age. He also decided that there should be a fairly accurate technique of measuring the distance between the medial malleoli in order to determine the need for treatment of pathological knock knee. If therapy is indicated, then comparative figures would reveal the success of the treatment. An attempt was made to establish normal values for each year by measuring children seen in his practice and in nursery schools. Measurements were made on 239 children, and in 7 the values exceeded the average so much that they were definitely abnormal. It was found that children of 3 years have the greatest deviation, and it is now felt that a distance of over 3.5 cm. at this age is evidence that a special shoe is indicated, with a wedge on the inner border.

American Heart Journal, St. Louis

43:1-160 (Jan.) 1952

Clinical and Physiological Correlations in Patients with Mitral Stenosis. V. B. M. Lewis, R. Gorlin, H. E. J. Houssay and others.—p. 2.
Morphology of Unipolar Leads Recorded at Septal Surfaces: Its Application to Diagnosis of Left Bundle Branch Block Complicated by Myocardial Infarction. D. Sodi-Pallares and M. I. Rodríguez.—p. 27.
Electrocardiographic and Morphologic Study of Changes Following Ligation of Left Coronary Artery in Human Beings: Report of Two Cases. G. K. Graham and E. G. Laforet.—p. 42.
Effect of Change from Supine to Sitting Position on Chest Leads. E. Simonson.—p. 53.
Angiocardiographic Confirmation of Pericardial Effusion. L. Levy II, R. Fowler, H. Jacobs and others.—p. 59.
Some Factors Affecting Clearance of Na^{24} from Human Muscle. L. H. Wisham and R. S. Yallow.—p. 67.
Clinical and Cardiac Catheterization Findings Compatible with Ebstein's Anomaly of Tricuspid Valve: Report of Two Cases. B. van Lingen, M. McGregor, J. Kaye and others.—p. 77.
Ventricular Tachycardia Following Administration of Quinidine. D. G. Wetherbee, D. Holzman and M. G. Brown.—p. 89.
*Ligation of Vena Cava in Treatment of Heart Failure. P. Cossio.—p. 97.

Ligation of Vena Cava in Heart Failure.—Cossio states that in 1948 he and Perianes proposed ligation of the inferior vena cava below the renal veins to control left cardiac failure that no longer responds to medical treatment, including absolute rest in a suitable position, low sodium diet, and administration of digitalis and mercurial diuretics. In a later report, based on observations in a larger series, they attributed the disappearance of the edema in the lower limbs after ligation of the vena cava to the improved lymphatic drainage of the lower half of the body as a consequence of the drop in venous pressure in the upper half, which, in turn, was caused by improvement of cardiac function. On the other hand, they ascribed the appearance of edema in the lower limbs after the ligation to blockage of the lymphatic return by mechanical damage or inflammation of the tributary vessels and lymph nodes. The author mentions others who have employed ligation of the vena cava, and then summarizes his own observations in a total of 90 cases in which he performed ligation of the inferior vena cava for uncontrollable heart failure. The surgical mortality was initially 25%, but it was soon reduced to 6%. Early improvement was observed in 70% of the patients and was maintained for months or even years in 56% if medical treatment was continued. The early improvement is attributed to reduction of blood return to the heart, and the later improvement to formation of a lake of blood, with a slower return in the recumbent position, and also to elimination of the source of microemboli.

American J. Digestive Diseases, Fort Wayne, Ind.

19:1-32 (Jan.) 1952

Hyperinsulinism—Factor in Rheumatoid Arthritis. E. M. Abrahamson. —p. 1.
Effect of Banthine on Gastric Secretion of Young, Normal Subjects. L. J. Notkin.—p. 4.
Simplified Method for Calculation of Diabetic Diets. S. B. Beaser.—p. 6.
Clinical Studies of Blood Lipid Metabolism: I. Normal Blood Lipid Variations of Phospholipids, Neutral Fats, Total Lipids, and Lipid Fraction Percentages. A. A. Goldbloom.—p. 9.
Sigmoido-Rectal Intussusception and the Unstable Colon. E. Granet. —p. 19.
Primal Affections of Appendices Epiploicae. C. Bearse.—p. 22.
Treatment of Obesity. S. Weiner.—p. 24.

American Journal of Hygiene, Baltimore

55:1-154 (Jan.) 1952

Evaluation of Monovalent Influenza Virus Vaccines: I. Observations on Antibody Response Following Vaccination. G. Meiklejohn, D. L. Weiss, R. I. Shragg and E. H. Lennette.—p. 1.
Id.: II. Observations During Influenza A-Prime Epidemic. G. Meiklejohn, C. H. Kempe, W. G. Thalman and E. H. Lennette.—p. 12.
Comparison of Infections in Three Species of Schistosomes, Schistosoma Mansoni, Schistosoma Japonicum and Schistosomatium Douthitti. L. Oliver.—p. 22.
Tuberculosis Induced by Droplet Nuclei Infection: Pulmonary Tuberculosis of Predetermined Initial Intensity in Mammals. H. L. Ratcliffe. —p. 36.
Studies of Distribution of Poliomyelitis Virus: VI. In Small Community in Epidemic Area. G. C. Brown, J. D. Ainslie, A. G. Gilliam and others.—p. 49.
Effect of Drugs on Excretion of Theiler's Virus (TO) by Mice. G. A. LoGrippo, D. P. Earle Jr., B. B. Brodie and others.—p. 55.
Effect of Mercurial Compound in Suppressing Intestinal Carriage of Theiler's Virus (TO) in Mice. G. A. LoGrippo, D. P. Earle Jr., J. Graef and R. Ward.—p. 70.
Serologic Studies of Corynebacterium Diphtheriae: III. Cultural Grouping and Serologic Typing of Diphtheria Field Cultures from Pacific Coast Region of the United States. V. J. Freeman and G. H. Minzel.—p. 74.
Studies of Coxsackie Viruses: Laboratory Aspects of Group Viruses. E. A. Beeman, R. J. Huebner and R. M. Cole.—p. 83.
*Immune Responses in Human Volunteers upon Oral Administration of Rodent-Adapted Strain of Poliomyelitis. H. Koprowski, G. A. Jervis and T. W. Norton.—p. 108.
*Poliomyelitis in Pregnancy. G. W. Anderson, G. Anderson, A. Skaar and F. Sandler.—p. 127.
Preliminary Evaluation of Immunizing Power of Chick-Embryo 17D Yellow Fever Vaccine Inoculated by Scarification. G. W. A. Dick. —p. 140.

Immune Responses in Humans to Orally Administered Poliomyelitis Virus.—The TN strain of poliomyelitis virus, which was used in the studies described here, displayed a remarkably low virulence for rhesus monkeys when injected intracerebrally.

Periodicals on file in the Library of the American Medical Association may be borrowed by members of the Association or its student organization and by individual subscribers, provided they reside in continental United States or Canada. Requests for periodicals should be addressed "Library, American Medical Association." Periodical files cover only the last 11 years, and no photoduplication services are available. No charge is made to *members*, but the fee for other borrowers is 15 cents in stamps for each item. Only three periodicals may be borrowed at one time, and they must not be kept longer than five days. Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted.

Material used for human feedings was prepared by giving viable suspensions of virus intracerebrally to cotton rats. After showing signs of paralysis the animals were killed, and their brains and spinal cords were removed aseptically. A 20% tissue suspension by weight was prepared with 5% aqueous dextrose used as diluent. The material was then placed in glass ampuls, which were flame sealed and stored in the frozen state. After thawing, the infectious material was given orally to the volunteers either alone or in milk or corn syrup. For the mouse neutralization tests, the MEF1 strain of poliomyelitis virus at the 64th hamster passage was used. Three of the 20 volunteers possessed neutralizing power against the MEF1 strain of virus prior to ingesting the TN strain, and the immunological status of two other volunteers proved difficult to determine by neutralization test, but the serums of the other 15 volunteers had no neutralizing power against MEF1 strain. Twelve of the 15 excreted virus in their stools at some time later than four days after ingestion of the TN strain. Neutralizing antibodies were found in the serum of all 15 volunteers. Observations on the subjects whose serum contained neutralizing antibodies before the ingestion of the virus suggests that the presence of circulating neutralizing antibodies does not preclude establishment of a carrier state with homologous virus. Furthermore, some showed a second carrier phase, which proves that the carrier state is compatible with the presence of a high antibody level, and it is not, as has been suggested by others, conditioned by a decline in serum antibody level. A discussion of oral administration of TN virus in terms of an immunizing process is regarded as premature until the safety of the procedure has been established. However, one may speculate upon the possibility that feeding of the TN strain to nonimmune human beings may induce a state of serological immunity of such magnitude that it would check invasion of the central nervous system by a homotypic virus, even when an intestinal carrier state results.

Poliomyelitis in Pregnancy.—There is a general belief that pregnancy increases susceptibility to poliomyelitis, and it has been suggested that the increased susceptibility is connected with endocrine imbalance. The 1946 poliomyelitis outbreak in Minnesota furnished an opportunity to study a relatively large number of cases of poliomyelitis associated with pregnancy and to gather data regarding menstrual histories that might reflect subclinical endocrine imbalances. The records of 75 pregnant women who had poliomyelitis are analyzed. Eight of these died. There was no evidence of a greater severity of the infection among pregnant women than among a comparable group of nonpregnant married women simultaneously attacked. The attack rate among pregnant women is higher than among an estimated control group of nonpregnant married women. The higher attack rate in pregnancy cannot be explained on the basis of greater degree of exposure to infection. There was a slight concentration (and especially of serious cases) in the second to fifth month. There was a predominance of male fetuses among these patients, especially those attacked in the early stages of pregnancy. The rate of congenital abnormalities was not unduly high among the children born to these women who had poliomyelitis during pregnancy.

American Journal of Ophthalmology, Chicago

35:1-166 (Jan.) 1952

Phasic Variations in Ocular Tension in Primary Glaucoma: Sixth Proctor Lecture. S. Duke-Elder.—p. 1.
Hydrosulphosol as Treatment of Chemical Burns of Eye. R. S. McLaughlin.—p. 21.
Lability Test and Gonioscopy in Diagnosis of Glaucoma. M. G. Ross. —p. 25.
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Galactose Cataractogenesis: Review of Literature and Case Report. C. Reiter and M. A. Lasky.—p. 69.
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Transverse Furrows of Nails as Differential Diagnostic Mark in Central Scotomas. A. Obal.—p. 83.
Retracted Eye Socket. A. E. Sherman.—p. 89.

American Journal of Public Health, New York

42:1-114 (Jan.) 1952. **Partial Index**

Q Fever Studies: XII. Certain Observations on Relationships Between Serologic Tests for Brucellosis, Syphilis and Q Fever. E. H. Lennette, W. H. Clark and F. W. Jensen.—p. 12.
Outbreak of Epidemic Pleurodynia, with Special Reference to Laboratory Diagnosis of Coxsackie Virus Infections. A. S. Lazarus, E. A. Johnston and J. E. Galbraith.—p. 20.
Incidence of Parapertussis in Grand Rapids Area as Indicated by 16 Years' Experience with Diagnostic Cultures. G. Eldering and P. L. Kendrick.—p. 27.
Level of Immunization of Preschool Children in Wichita. D. O. Cowgill. —p. 32.
Labor, Management, and Official Agency—Relationships Illustrated by Plant Study. H. K. Abrams.—p. 38.
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Public Health in the United States—Appraisal of Local Health Services. V. A. Van Volkenburgh.—p. 49.
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Am. J. Roentgenol. & Rad. Therapy, Springfield, Ill.

76:1-182 (Jan.) 1952

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Estimation of Dosage for Intravenously Administered P^{32}: Calculation Based on Two Compartment Distribution of Isotope. B. V. A. Low-Beer, R. S Blais and N. E. Scofield.—p. 28.
*Metabolism of Radioactive Iodine (I^{131}) in Patients with Cardiac Disease. F. R. Birkhill, K. E. Corrigan and H. S. Hayden.—p. 42.
Further Observations on Diagnostic Value of Pulmonary Angiography in Bronchiogenic Carcinoma. D. J. Schissel and P. G. Keil.—p. 51.
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*Detection of Gastric Carcinoma by Photofluorographic Methods: Part III. Findings. J. F. Roach, R. D. Sloan and R. H. Morgan.—p. 68.
Leiomyosarcoma of Stomach with Excavation of Center of Tumor. J. H. Marks.—p. 76.
Roentgenographic Study of Synovioma. R. S. Sherman and F. C. H. Chu.—p. 80.
Pyogenic Osteomyelitis of Spine. J. E. Wear, G. J. Baylin and T. L. Martin.—p. 90.
Degenerative Osteoarthritis of Hip Joint: Pathogenesis of Enlarged Femoral Head (Coxa Magna) and Defective Acetabulum. T. Horwitz. —p. 95.
Case of Osteogenesis Imperfecta Diagnosed in Utero. H. W. Frerking and O. C. Zink.—p. 103.
New Roentgen Sign of Fetal Death. S. N. Tager.—p. 106.

Metabolism of Radioactive Iodine.—The effects of varying degrees of cardiac failure on the metabolism of radioactive iodine (I^{131}) were studied by observation of the soft tissue retention, thyroid gland uptake, and urinary excretion in 20 patients with severe cardiovascular disease who had been given a 50 μc carrier-free dose of I^{131} orally before breakfast on the initial day of study. Of the 20 patients, 14 had gross evidence of cardiac failure, while the remaining 6 had no clinical edema at the time of study. The results in this group of patients were compared with those obtained in 44 patients showing no significant cardiac disease; 23 had varying levels of total thyroid function as judged by total urinary I^{131} excretion. Certain abnormalities of I^{131} metabolism were characteristic in the patients with cardiac decompensation. These included pronounced soft tissue retention of I^{131} from 24 to 36 hours after ingestion of the material, together with deficient I^{131} concentration in the thyroid gland during this time. In addition, certain changes in the pattern of urinary excretion of I^{131} throughout the period were noted. Attention is called to the fact that these changes in the metabolism of I^{131} may occasionally mask the presence of latent thyrotoxicosis in a patient with cardiac disease. In still other situations occult edema as a prodrome of gross cardiac decompensation may be detected by I^{131} tracer studies before clinical evidence appears.

Detection of Gastric Cancer by Photofluorographic Methods.—In 29 months 10,000 photofluorographic gastrointestinal examinations were made at the Johns Hopkins Hospital in dispensary patients, 4,584 men and 5,416 women, aged over 40. Six exposures were made for each patient, all with the patient in the recumbent position, the average fasting time being approximately three to four hours, and the total amount of barium sulfate, water, and chocolate malt mixture being 6 oz. (180 cc.).

Of the 10,000 patients, the stomach was visualized well enough in 9,072 (90.7%) to warrant a diagnostic interpretation, while in the remaining 928 cases (9.3%) the stomach was inadequately demonstrated. Of the 928 patients, 528 (5.3% of all patients studied) obtained unsatisfactory results because of the presence of excessive food within the stomach, 345 (3.5%) because of technical errors, and 55 (0.5%) because of excessive obesity. Of the 9,072 patients with satisfactory miniature studies, the stomach was interpreted as normal in 8,219 (90.6%), while in 853 (9.4%) the stomach appeared to be abnormal. The duodenal bulb was thought to be normal in 4,532 patients (50%) and abnormal in 200 (2.2%), and was inadequately visualized in 4,340 (47.8%). Of the 9,072 patients with satisfactory miniature studies, 1,209 (13.3%) also received standard gastrointestinal examinations, while in 7,863 patients (86.7%) the miniature studies were not checked by regular gastrointestinal series; of the latter the stomachs of 7,462 were thought to be normal and of 401 to be abnormal. In 185 of the latter patients the presence of neoplastic disease could not be completely excluded. In the 1,209 patients comparison of the gastric findings of regular and miniature studies showed that in 732 patients (60.6%) the stomach was interpreted as normal on both the regular and the miniature studies. In 126 patients (10.4%) the stomach was observed to be abnormal on both studies, and in 307 patients (25.4%) it was thought to be abnormal on the miniature study, only to have a standard gastrointestinal series reveal a normal stomach. This appears to be an excessively high error but these patients were much more likely to receive the standard series than were those in whom the miniature study was reported as showing a normal stomach. If one includes all of the satisfactory miniature studies, the false positive error falls to 3.3% and this is felt to be a more accurate estimate of the situation. There were only 17 patients in whom the miniature studies were interpreted as showing a normal stomach, only to have the standard examination reveal the presence of gastric pathology. Any apparent abnormality on the miniature study should be checked with a standard gastrointestinal study before a definite opinion is reached regarding the status of the stomach. The number of persons with asymptomatic gastric cancers or their precursors is relatively small, being approximately 1 per 476 examinations in the authors' series. Only a few of these could be persuaded to submit to surgery prior to development of symptoms. It appears that the general public must receive further education concerning the gastric cancer problem before photofluorography will be successful in reducing the death rate from malignant gastric growths. If only those patients are considered in whom potentially benign gastric lesions detected by the miniature studies were actually confirmed by standard examinations, the over-all incidence is 1.3%, or 1 per 79 examinations. The chief drawback to use of the photofluorographic method for mass surveys is the considerable number of cases in which the duodenal bulb is inadequately visualized for diagnostic purposes. Currently efforts are being made to reduce this number by prolonging the interval between the taking of the opaque medium and the filming process. With the photofluorographic method it should be possible to greatly reduce the number of standard examinations in large institutions where considerable numbers of gastrointestinal examinations are requested by the clinicians, thus resulting in a considerable saving in time and expense to the clinician and patient.

Annals of Western Medicine & Surgery, Los Angeles

6:1-68 (Jan.) 1952

*Range of Usefulness of Commercial Stainless Steel Cloths in General and Special Forms of Surgical Practice. W. W. Babcock.—p. 15.

Toxic Reactions to Terramycin: Report of Case. R. X. DeMangus. —p. 24.

The Law of Abortion. L. J. Regan.—p. 26.

Painful Conditions Simulating Heart Disease. R. W. Langley.—p. 49.

Stainless Steel Cloths in Surgical Practice.—Annealed stainless steel wire has been used in surgery since 1929. In 1947 Babcock inquired into the possibility of obtaining the wire in the form of a mesh or screen for surgical use, and various fine steel cloths were tested by implantation into dogs and then were tried clinically. It is important that only the alloys 18—8 stainless steel be used, as other stainless or rustless alloys at present available cause undesirable tissue reaction or, like vitallium, lack ductility or tensile strength. Stainless steel cloth may be repeatedly sterilized by boiling or by superheated steam without injury. Previous to sterilization a degreasing solution should be applied, followed by scrubbing with a brush and soap and thorough rinsing. Sharp projecting points of wire should be trimmed off or rolled back before implantation. Of the soft and flexible screens classified grade 1, five different types have been selected and are used for abdominal hernias or to cover defects in the thoracic wall. They may be placed against omentum, intestines, lung, or heart, and may be used to surround and reinforce large blood vessels and aneurysms and to repair defects in the diaphragm, pleura, or dura, as well as to replace or reinforce defective subcutaneous tissue. Thin but stiffer forms of mesh classified as grade 2 may be used to cover defects on the trachea and larynx, or to replace cartilage and restore contours to the nose, ears, and eyelids, to form a new floor for the orbit. Grade 3 includes the thicker and more rigid screens that are adequate to cover defects in the skull and to bridge bony defects in various other parts of the skeleton. It has been suggested that serious damage may result from the action of solar, roentgen, or diathermic radiation on parts that contain embedded metal, but the author says that many patients having buried wire sutures or screen in the abdominal wall or cavity have been exposed to roentgen rays without evidence of damage. He admits, however, that conditions may be different if a large plate of tantalum or alloy steel fills a large defect in the skull, lying close to the brain. In such a case diathermy should not be used, and exposure to the hot sun or to x-rays should be brief.

Circulation, New York

5:1-160 (Jan.) 1952

*Chest Pain in Association with Pulmonary Hypertension: Its Similarity to Pain of Coronary Disease. W. N. Viar and T. R. Harrison.—p. 1.

Study of Digitalis-Like Action of Thevetoidin in Man. I. Chavez, R. Méndez and L. O. Chait.—p. 12.

Treatment of Hypertension with Hexamethonium. E. D. Freis, F. A. Finnerty Jr., H. W. Schnaper and R. L. Johnson.—p. 20.

*Effect of 1-Hydrazinophthalazine in Hypertension. H. A. Schroeder. —p. 28.

Effects of Valsalva-Like Maneuver upon Circulation in Normal Individuals and Patients with Mitral Stenosis. H. Goldberg, E. I. Elisberg and L. N. Katz.—p. 38.

Epicardial Electrocardiograms Recorded in Course of Seven Cases of Heart Surgery. G. J. Carouso, H. A. Chevalier, B. I. Latscha and J. Lenègre.—p. 48.

Distribution of Body Fluids in Congestive Heart Failure: IV. Exchanges in Patients, Refractory to Mercurial Diuretics, Treated with Sodium and Potassium. J. R. Elkinton, R. D. Squires and L. W. Bluemle Jr. —p. 58.

Size of Heart During Course of Essential Hypertension. M. Kleinfeld and J. Redish.—p. 74.

Quantitative Studies in Man of Cardiovascular Effects of Reflex Vagal Stimulation Produced by Carotid Sinus Pressure: I. Localization of Increased Effect in Patient with Angina Pectoris. A. J. Linenthal. —p. 81.

Mercurial Diuresis in Edematous Individuals. G. T. Lesser, M. F. Dunning, F. H. Epstein and E. Y. Berger.—p. 85.

Norepinephrine and Epinephrine Effect on Renal Hemodynamics: With Particular Reference to Possibility of Vascular Shunting and Decreasing Active Glomeruli. J. H. Moyer and C. A. Handley.—p. 91.

ATHEROSCLEROSIS: A SYMPOSIUM

Experimental Atherosclerosis. L. N. Katz.—p. 101.

Human Atherosclerosis and Diet. A. Keys.—p. 115.

Blood Lipids and Human Atherosclerosis. J. W. Gofman, H. B. Jones, T. P. Lyon and others.—p. 119.

Chest Pain in Pulmonary Hypertension.—Pain of pulmonary hypertension, which resembles the pain of coronary disease in nature and in the tendency to be initiated by physical exertion, can usually be differentiated if the clinical features of the syndrome are thoroughly understood. The existence of a condition capable of causing pulmonary hypertension offers a clue to correct diagnosis. The commonest underlying conditions are (1) mitral lesions, usually stenotic but occasionally regurgitant; (2) primary diffuse lung disorders, especially asthma, emphysema, and bronchiectasis; (3) pulmonary arterial disorders, oftenest embolism; and (4) congenital malformations of the heart leading to increased pressure in the pulmonary artery. Other guides may be long-standing cough, cyanosis, associated dyspnea, pain on breathing, variable duration of pain, clinical evidence of right ventricular hypertrophy, electrocardiographic changes, evidence of tissue destruction, and effects of oxygen and drugs. Consideration of these factors should aid in differentiation of the two types of pain. The prognosis in pulmonary hypertension is better than in coronary disease: attacks of pain have a less ominous significance, and sudden and unexpected death is less likely to occur. Treatment is essentially that of the causative condition; oxygen and aminophylline administered rectally may prove beneficial. The similarity between the pain of pulmonary hypertension and that of coronary disease is probably due to the fact that the afferent nerves from the pulmonary artery enter the nervous system by the same pathways as those from the heart. The pain apparently originates in the pulmonary artery itself, resulting from distention of the vessel.

Effect of 1-Hydrazinophthalazine in Hypertension.—A true antihypertensive drug should lower blood pressure without affecting the myocardium adversely, decreasing renal blood flow, or altering blood volume or viscosity. 1-Hydrazinophthalazine and 4-methyl-1-hydrazinophthalazine met these requirements when given experimentally to 50 patients with arterial hypertension. They are relatively nontoxic and are the most effective hypotensive agents so far encountered for practical clinical use, but their effectiveness is only partial and varies with the type of hypertension. The most pronounced effects were seen in neurogenic hypertension, some cases of malignant hypertension, and after lumbodorsal sympathectomy; effects were minimal in cases of severe renal hypertension when renal function was good. Serious chronic toxic manifestations were not observed, even in patients receiving the drugs for as long as eight months. Side-reactions consisted of headache, tachycardia, postural hypertension (sometimes severe), nausea and vomiting, and, in seven serious cases, cerebral symptoms ranging from mild anxiety and depression to acute anxiety or severe depression and coma (in two severely uremic patients). Most of these reactions either diminished or disappeared while the drugs were being given; in only four cases of headache was it necessary to discontinue the treatment. Dosage consisted of 50 to 150 mg. given orally every four to six hours in hospitalized patients and three to five times a day to outpatients. The average diastolic blood pressure drop was 20 mm. Hg or more in 35 cases, but in only a few of the mildest cases were normotensive levels sustained.

Neurology, Minneapolis

2:1-82 (Jan.-Feb.) 1952

Syndrome of Periodic Paralysis. W. W. Hofmann.—p. 1.
Syndrome of Anterior Spinal Artery. A. T. Steegmann.—p. 15.
Spread of Sensory and Motor Loss After Nerve Injury. M. Kelly.—p. 36.
Face-Hand Test as Diagnostic Sign of Organic Mental Syndrome. M. Fink, M. Green and M. B. Bender.—p. 46.
Use of Benadryl for Symptomatic Relief of "Thalamic Pain." R. W. Barris.—p. 59.

New England Journal of Medicine, Boston

246:1-40 (Jan. 3) 1952

*Sex Hormones in Advanced Breast Cancer. E. F. Lewison and R. G. Chambers.—p. 1.
Malignant Hypertension with Unilateral Renal-Artery Occlusion. H. L. Goodman.—p. 8.
Role of the Internist in a Mental-Hygiene Clinic. S. P. Seigle, I. Schnap and R. A. Castagno.—p. 12.
Effect of Depo-Heparin on Prothrombin Time, with Observations on Combined Use of Heparin and Dicumarol. J. B. Holyoke and H. J. Wheelwright Jr.—p. 15.
Artificial Kidney. J. P. Merrill.—p. 17.

Sex Hormones in Advanced Breast Cancer.—This paper describes observations on 80 women with advanced breast cancer who were treated with androgens or estrogens for at least three months. A favorable subjective response was obtained in 46 of 57 patients receiving androgens and in 21 of 40 receiving estrogens. Bone metastases showed objective improvement in 8 of 32 patients receiving androgens and in 3 of 11 patients receiving estrogens. Soft tissue lesions showed objective improvement in 17 of 48 patients receiving androgens and in 12 of 34 receiving estrogens. The clinical response to sex steroids is unpredictable. The estrogens appear to be most effective in postmenopausal women, whereas the androgens may be of value regardless of age. Optimum response requires administration of an adequate total dose over a sufficient length of time. The sex hormones are not a "cure" for breast cancer, but they do offer gratifying benefits in patients beyond the scope of surgery or radiotherapy.

New York State Journal of Medicine, New York

52:1-112 (Jan. 1) 1952

Control of Communicable Disease in Hospital Nurseries for Newborn: Progress Report, New York State Plan. R. F. Korns, E. R. Schlesinger and M. Y. Phaneuf.—p. 39.
Differential Use of Health Resources by Rural People. O. F. Larson and D. G. Hay.—p. 43.
Recent Trends in Tuberculosis in New York City. A. B. Robins.—p. 50.
What Physician Should Know About Current Status of Dental Caries Prophylaxis. D. B. Ast.—p. 57.
Symposium: Community Planning and Evaluation of Pediatric Services
  Midcentury White House Conference on Children and Youth: Health Aspects. A. D. Kaiser.—p. 63.
  Four Years After. G. A. Wheatley.—p. 68.
Adolescent Drug Addiction. J. M. Toolan, P. Zimmering and S. B. Wortis.—p. 72.
Gastrointestinal Studies in Paraplegic: I. Bowel Management in Paraplegia. K. C. Keeler and H. A. Rusk.—p. 75.
Rehabilitation in Institutional Geriatrics: Preliminary Report. L. Dobrin.—p. 81.
Modification of Hofmeister Gastrectomy Operation. M. Weinstein and M. Roberts.—p. 86.
Analgesic Action of Subdamine. Effect of Subdamine on Pain Threshold and in Treatment of Idiopathic Glossodynia. A. H. Kutscher.—p. 91.

North Carolina Medical Journal, Winston-Salem

12:573-628 (Dec.) 1951

Public Health Aspects of Civil Defense. C. P. Stevick and J. W. R. Norton.—p. 573.
Cardiac Arrest During Anesthesia and Surgical Operations. T. C. Bost.—p. 579.
Malignant Adenomas of Colon and Rectum (Adenoma Malignum). R. S. McElwee and S. W. Moore.—p. 586.
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Clinical Aspects of Treatment of Syphilis. G. E. Koury.—p. 600.
Pupillary Changes Associated with Diabetic Neuropathy. W. D. Pryor.—p. 605.
Diagnosis of Tumors of Uterine Canal. W. B. Norment.—p. 607.

13:1-52 (Jan.) 1952

Coronary Occlusion Before Age of Forty: Report of 23 Cases. J. G. Smith.—p. 1.
Pains in Chest—"True or False." R. L. McMillan.—p. 9.
Some Comparisons of Neuropsychiatric Casualties in Recent American Wars. W. E. Wilkinson, G. F. Southerland and W. C. Betts.—p. 11.
Myxedema: Controllable Condition Which is Frequently Overlooked. G. T. Harrell.—p. 15.
Cortisone and Aureomycin in Treatment of Case of Rocky Mountain Spotted Fever. W. C. Arney.—p. 20.
Body Potassium Loss During Therapy with ACTH and Cortisone. J. K. Aikawa and J. H. Felts Jr.—p. 22.
Use of Oral Vasoconstrictors in Rhinology. J. S. Gordon.—p. 24.
Physiologic Correction of Internal and External Nasal Deformities. C. N. Patterson.—p. 29.
*Carbon Dioxide Retention During Oxygen Therapy. J. B. Hickam, H. O. Sieker, W. W. Pryor and J. M. Ryan.—p. 35.
*Black Widow Spider Bite Syndrome. L. J. Taubenhaus.—p. 37.
Complications of Poison Ivy (Rhus Toxicodendron) Dermatitis. S. W. Barefoot.—p. 40.

Carbon Dioxide Retention During Oxygen Therapy.—The lungs have the function of eliminating carbon dioxide as well as of absorbing oxygen. Oxygen therapy can increase oxygen absorption, but there is no similarly effective means of facilitating carbon dioxide elimination. In patients who become accustomed to high tensions of carbon dioxide, the respiratory center is no longer normally sensitive to this gas; instead, much of the respiratory stimulus is being supplied by the low arterial blood oxygen tension. When this stimulus is abruptly removed by oxygen therapy, respiration is slowed, and the blood carbon dioxide tension rises rapidly. The methods used in the analysis of arterial blood gases were described elsewhere by the authors; in this report they present four patients in whom the blood carbon dioxide became extremely high during oxygen therapy. These patients had mental disturb [illegible] lethargy, ar [illegible] ma. Carbon dioxide poisoning can c [illegible] r during [illegible] ged oxygen therapy, and its recogniti [illegible] rify situ [illegible] at may appear quite p [illegible]

Black Widow Spider Bites.—The black widow spider (Latrodectus mactans) has been reported in all but seven states. The syndrome caused by the sting of this insect should be recognized particularly by physicians in rural practice, the author having observed 18 cases during three years' of rural practice in southeastern North Carolina. The belief that most patients are bitten by this spider while using a privy was not borne out by the author's observations that many were bitten on the upper extremities while picking up sticks and firewood, and on the toes while putting on shoes that had not been worn recently. Symptoms usually start with severe pains in the bones, muscles, and joints, and spread to the back and abdomen. In most cases the abdominal pain is so severe that it masks all other pain. The abdomen is frequently board-like, resembling that seen with a ruptured peptic ulcer, and many patients have been mistakenly subjected to surgery. The fact that the patient may not recall the sting makes the diagnosis difficult. The author feels that patients with an acutely painful abdomen should be asked about having received a sting. The latent period after the bite varies from 15 minutes to 4 hours. Calcium gluconate or magnesium sulfate given intravenously are excellent drugs for relieving pain and spasm, but their effect is only temporary and they do not shorten the duration of the illness. If this treatment is used, the alternate injection of 10 cc. of a 10% solution of calcium gluconate and 2 cc. of a 50% solution of magnesium sulfate is probably better than administration of only one of these drugs. The author uses the therapeutic method recommended by Miller. On diagnosis 10 cc. of a 10% solution of calcium gluconate or 2 cc. of a 50% solution of magnesium sulfate is given intravenously to relieve the pain. Then the patient is tested for serum sensitivity, after which one vial of antivenin is given intramuscularly. Usually this is all that is necessary, but occasionally more antivenin is needed. The use of specific antivenin is the best treatment. It avoids prolonged suffering and makes hospitalization unnecessary.

Oklahoma State Medical Assn. J., Oklahoma City

45:1-44 (Jan.) 1952

Penetrating Abdominal Injuries. C. M. O'Leary.—p. 4.
Use of Banthine in Treatment of Duodenal Ulcers. T. E. Johnston.—p. 7.
Role of Potassium in Body. J. B. Morey.—p. 10.
*Treatment of Myocardial Infarction Due to Coronary Thrombosis: Preliminary Report. W. T. McCollum.—p. 15.

45:45-86 (Feb.) 1952

Spontaneous Rupture of Esophagus. R. L. Anderson.—p. 49.
Management of Urological Problems in General Practice. E. N. Lubin.—p. 53.
Face Injuries. G. H. Kimball.—p. 56.
Local Anesthesia in Obstetrics. J. L. McKelvey.—p. 58.
Recent Advances in Diagnosis and Treatment of Cancer. H. A. Burnett.—p. 61.

Treatment of Myocardial Infarction.—This report is based on 80 cases in which the diagnosis of myocardial infarction was based on electrocardiographic records of definite breakdown in the QRS complex. After the diagnosis had been established, the patient was given 16 mg. of morphine sulfate and 0.43 mg. of atropine sulfate either intravenously or subcutaneously, depending on the severity of the pain. When necessary, this dose was repeated. Quinidine sulfate in doses of 0.2 gm. was given orally every four hours, day and night. At the end of two weeks the dosage was reduced to 0.2 gm. every four hours during the day and 0.4 gm. at bedtime. The anticoagulant effects of bishydroxycoumarin were supplemented by those of aqueous heparin in 50 mg. doses intravenously every four hours, day and night, for the first 48 to 72 hours, until the prothrombin time had time to reach a therapeutic level. The initial dose of bishydroxycoumarin was 300 mg. on admission. Further doses were adjusted on the basis of daily determination of prothrombin time. The prothrombin time was maintained between two and three times the normal time. The administration of bishyroxycoumarin was usually continued until the patient became ambulatory. Patients were kept in bed until the electrocardiographic record revealed healing of the lesions, the sedimentation rate returned to normal, and the pulse and blood pressure were stabilized. Oxygen was given routinely at a rate of 5 liters per minute by nasal catheter. Since the mortality is reportedly twice as high in patients in whom the systolic blood pressure is below 100 mm. of mercury, McCollum gave these patients desoxyphedrine in 5 mg. doses, not exceeding 25 mg. per day. A decided fall in pressure was treated with a dose as high as 10 mg. intramuscularly at once and then 5 mg. doses every four hours for the first 24 hours, reducing the dosage in the second 24 hour period to the above mentioned total daily dose. The blood pressure routinely improved by 15 to 20 mm. Hg. To reduce the exertion involved in defecation, mineral oil is given at bed time or enemas are given if needed. The diet was liquid for the first two or three days and the sodium intake was restricted to 200 mg. per day. Ten of the 80 patients died. This over-all mortality rate of 12.5% included patients with previous infarctions; in those experiencing the initial myocardial infarction the mortality rate was 7.5%. The author feels that this low rate proves the adequacy of the treatment.

Public Health Reports, Washington, D. C.

67:1-120 (Jan.) 1952. **Partial Index**

Susceptibility of Anopheles Quadrimaculatus to Korean Vivax Malaria. M. D. Young and R. W. Burgess.—p. 14.
Venereal Disease Control Program in Transition. T. J. Bauer.—p. 17.
National Morbidity Reporting. C. C. Dauer.—p. 21.
Fluoridation of Municipal Waters, American Dental Association Symposium. F. S. McKay, A. P. Black, M. E. Nicholson and F. A. Bull.—p. 36.
Leadership and Conditions of Organizational Effectiveness. D. McGregor.—p. 42.
Observations on Epidemiology of Poliomyelitis. W. T. Fales and M. Taback.—p. 47.
*Trichophyton Tonsurans Ringworm—New Public Health Problem. L. K. Georg.—p. 53.
Aquatic Invertebrates as Indicators of Stream Pollution. A. R. Gaufin and C. M. Tarzwell.—p. 57.
Health Departments and the Housing Problem. R. J. Johnson.—p. 65.
Evaluating Health Education. A. L. Knutson.—p. 73.
Studies in Penicillin Treatment of Syphilis. R. C. Arnold, J. C. Cutler, R. D. Wright and S. Levitan.—p. 78.

Trichophyton Tonsurans Ringworm: New Public Health Problem.—For the past 8 to 10 years the common agent of ringworm of the scalp in the United States has been Microsporum audouini. In some sections of the country it is the cause of 80 to 90% of the cases of ringworm of the scalp. Now, however, ringworm infections due to Trichophyton tonsurans are becoming an increasingly important public health problem in the United States. Isolations of this fungus from clinical cases of ringworm of the scalp, as well as from ringworm of the glabrous skin and nails, are made more frequently than heretofore in certain sections of the country, especially in Texas and other southwestern states. The author of this paper found that in New York City T. tonsurans infections occurred chiefly among Puerto Ricans who had recently immigrated to the United States. Scattered cases have been reported from many other states. Since Mexico is an endemic area for T. tonsurans infections, it seems probable that the disease has been spreading into Texas and the southwestern states from this area. It is possible that T. tonsurans may produce a widespread epidemic in the school children in the United States in a fashion similar to that of epidemic ringworm due to M. audouini. The problem would be more difficult, however, because the infections occur in both children and adults. They are more difficult to detect and usually are more refractory to treatment.

Review of Gastroenterology, New York

18:833-936 (Dec.) 1951

Clinical Appraisal of Liver Function Tests. H. A. Rafsky, M. Weingarten and C. I. Krieger.—p. 845.
Gastroileostomy. J. M. Miller and R. J. Lipin.—p. 854.
Hemorrhoids: Etiology, Pathology and Treatment. (Part II). R. V. Gorsch.—p. 859.
Varices of Esophagus. E. Boros.—p. 878.
Giant Echinococcus Cyst of Spleen: Case Report. F. W. Bancroft.—p. 882.
Gastric Resection Followed by Stricture of Common Duct: Case Report. F. W. Bancroft.—p. 888.
Primary Ulcer of Jejunum. M. Rich and M. M. Sayet.—p. 895.
Results of Treatment of Bleeding Peptic Ulcer. G. B. Packard.—p. 903.
Perforations of Small Intestine Due to Nonpenetrating Trauma. B. J. Ficarra.—p. 908.

South Carolina Medical Assn. Journal, Florence

48:1-26 (Jan.) 1952

Treatment of Duodenal Ulcer and Functional Bowel Disease with Kolantyl, New Antispasmodic Compound: Preliminary Clinical Notes. B. N. Miller.—p. 1.
Rheumatic Carditis. J. A. Boone.—p. 6.
Painful and Painless Anorectal Lesions. L. Banov Jr.—p. 8.

48:27-56 (Feb.) 1952

Report of Case with Reference to Hazards of Sensitization Arising from Topical Medication. V. Moseley and S. Prystowsky.—p. 27.
Relief of Impotency by Cartilage Implants: Presentation of Technic. B. S. Chappell.—p. 31.
Dietary Problems in South Carolina. A. M. Moser.—p. 34.

South Dakota J. Med. & Pharmacy, Sioux Falls

4:317-342 (Dec.) 1951

Serum Protein Abnormalities Observed in Orthopedic Patients. R. E. Van Demark.—p. 317.
Eruptive Diseases of Contagious Nature. A. L. Hoyne.—p. 318.
Porphyria Mixed—Case Report. T. J. Billion Jr.—p. 321.

5:1-36 (Jan.) 1952

Tumors of Kidney. W. J. Baker and E. C. Graf.—p. 1.
Malignancies of Female Genital Tract. J. H. Randall.—p. 18.

Southern Medical Journal, Birmingham, Ala.

45:1-86 (Jan.) 1952. Partial Index

The Southern Doctor. C. Rosser.—p. 1.
Difficulties in Diagnosis of Certain Gastric Lesions. J. C. Bell.—p. 3.
Use of Protein Hydrolysates in Therapy of Peptic Ulcer. J. S. Levy. —p. 5.
Changing Pattern of Health Organization and Activities. J. W. Bass. —p. 9.
Laryngectomies in Review: 20 Years' Experience. F. E. LeJeune and M. Lynch.—p. 12.
Dextrocardia Secondary to Foreign Body in Left Bronchus: Report of Two Cases. M. Equen, F. Buckner, G. Roach and R. Brown.—p. 16.
Congenital Dysplasia of Hip Joint in Early Infancy. R. D. Hawkins. —p. 18.
Histochemical Approach to Pathology Exemplified in Studies on Glomerular Disappearance. J. F. A. McManus.—p. 24.
Extra-Mammary Paget's Disease: Discussion of Pathogenesis. J. W. Eversole.—p. 28.
Early Treatment of Thoracico-Abdominal Wounds. J. M. Mason III. —p. 30.
Continuous Spinal Anesthesia in Treatment of Severe Preeclampsia and Eclampsia. G. R. Jones, H. H. Ware Jr., E. C. Garber and P. J. McElrath.—p. 34.
Pathologic Conditions Treated by Proctologists. J. E. Linn.—p. 43.
Present Day Methods of Treatment of Carcinoma of Cervix. H. D. Kerr. —p. 47.
The Maternal Breast. D. Findley.—p. 51.
ACTH and Cortisone: Their Role in Dermatologic Therapy. J. L. Callaway.—p. 63.
Value of ACTH and Cortisone in Ocular Inflammations: Preliminary Report. G. A. Lawrence Jr.—p. 65.
Some Aspects of Negativistic Phenomena. H. P. Harris Jr.—p. 70.
*Pyloric Stenosis in Monovular Twins: Report of Case. G. C. Cunningham and J. J. Kelly.—p. 75.
*Simultaneous Herpes Zoster and Chickenpox: Report of Two Cases. S. D. Austin, W. H. Brandon and R. R. McGee.—p. 76.

Pyloric Stenosis in Monovular Twins.—A case of hypertrophic pyloric stenosis in each of monovular twins is reported, bringing the total reported cases to 12. There have been only two cases of hypertrophic pyloric stenosis reported in monovular twins with only one twin affected. The rule rather than the exception of its occurrence in both of monovular twins is strong evidence in favor of a genetic factor in the etiology.

Simultaneous Herpes Zoster and Chickenpox.—Chickenpox has frequently been noted to follow exposure to herpes. It has been postulated that the two eruptions represent different phases of the same disease. Another theory suggests that chickenpox in childhood makes the individual immune to herpes zoster in later life. Since the two diseases rarely occur simultaneously, Austin and associates present two such cases recently observed by them. One of these was a man, aged 65, who had had no known recent exposure to either chickenpox or herpes zoster and who said that he had had chickenpox as a child. His generalized varicella rash disappeared entirely in one week. The herpetic eruption on the head improved fairly rapidly after treatment was started. The second patient was a man, aged 35, who had never had chickenpox before, and there was a history of exposure to chickenpox 16 days before the onset of symptoms.

Trans. Southeastern Sec. Am. Urolog. Assn., Memphis

15th Ann. Meet.:1-142 (March) 1951. Partial Index

*Role of Protective Urinary Colloids in Prevention of Renal Lithiasis. A. J. Butt.—p. 1.
Management of Calculi in Lower Ureter. W. L. Champion, M. F. Fowler, R. C. Coleman Jr. and T. J. Florence.—p. 11.
Hypertension and Surgical Kidney. A. D. Puppel and E. P. Alyea.—p. 15.
Postoperative Treatment Following Prostatic Surgery. J. B. Glanton, L. M. Orr and J. C. Hayward.—p. 25.
Transurethral Resection of Prostate. E. H. Ray.—p. 29.
New Female Air Cysto-Urethroscope. D. W. Goddard.—p. 37.
Interesting Bone Changes in Plain Urograms. W. L. Fitzgerald and M. D. Thomas Jr.—p. 41.

Protective Urinary Colloids in Prevention of Renal Lithiasis.—Although both crystalloids and colloids enter into the composition of urinary calculi, most investigations concerning prevention and treatment of calculi have been directed only toward diminishing the concentration of crystalloids in the urine. From what is known of the effects of the urinary colloids in increasing the solubility of stone-forming salts, it follows that if this protective power is diminished or abolished, urinary deposits will form more readily. Butt examined urine for colloidal activity and then made efforts to increase the protective urinary colloids. The spreading properties of hyaluronidase suggested that this drug might be useful for this purpose. Urine specimens from 34 subjects were examined for degree of colloidal activity. Then 0.02 mg. of hyaluronidase dissolved in 1 cc. of isotonic sodium chloride solution was injected subcutaneously, and colloidal activity of the urine was observed at different intervals. In 28 of the 34 subjects, colloidal activity was significantly increased following injection of hyaluronidase. Colloidal activity began to rise in 10 minutes, reached a peak in from 1 to 2 hours, and remained elevated for 24 to 96 hours. The patients who showed no increase in number of colloidal particles had renal calculi. There was no sedimentation in the urine of patients who had received hyaluronidase, as is usually the case. The author concludes that a clearer understanding of the urinary colloids helps explain why hydration is important in the prevention and treatment of urinary calculi. There appears to be a correlation between the fact that the colloidal activity is elevated in the Negro race as compared to the white race, and that the incidence of stone formation is less in Negroes. Observation of elevated colloidal activity in pregnant women offers an explanation as to why pregnancy, which is so often associated with dilatation and stasis of the urinary tract and increased excretion of calcium, is not more frequently complicated by urinary calculi. The fact that patients who have renal calculi have decreased urinary colloids suggests that reduction or absence of these protective colloids are a factor in the formation of stones in these patients.

U. S. Armed Forces Med. J., Washington, D. C.

2:1779-1932 (Dec.) 1951. Partial Index

Blood Vessel Bank. F. N. Cooke, D. M. Kuhns, J. T. Elston and others. —p. 1779.
Treatment of Leukemia and Similar Disorders. R. H. Smith.—p. 1787.
Defensive Medical Aspects of Biologic Warfare. M. J. Hantover.—p. 1795.
The Orthopedist in Above-the-Knee Amputations. L. E. Abt and A. Stern. —p. 1801.
Adenomatoid Tumor of Epididymis. U. L. Meeter and J. W. Schwartz. —p. 1815.
Aureomycin Therapy for Ambulatory Patients. L. H. Roth.—p. 1829.
Vasa Praevia. I. A. Beychok.—p. 1833.
Self-Administration of Mercaptomerin Sodium. B. E. Pollock and J. O. Gillespie.—p. 1837.
Surgical Importance of Schoenlein-Henoch Disease. E. T. Gordon. —p. 1845.
Echinococcus Cysts of Liver with Report of Two Cases. L. G. Bell, J. L. Yon and D. J. Williams Jr.—p. 1851.
Antibiotics in Treatment of Relapsing Fever. I. B. Harrison and R. M. Whittington.—p. 1859.
Intrahepatic Calcification. S. A. Kaufman.—p. 1863.
Diagnostic Significance of Fragment Displacement in Fractures of Carpal Navicular. G. H. Chambers and J. D. Blair.—p. 1871.
Infectious Mononucleosis Manifested by Diarrhea. S. H. Walker. —p. 1875.
Thrombosis of Aorta Arising from Patent Ductus Arteriosus. M. Kurzrok, C. V. Carlson and A. T. Ooghe.—p. 1879.
Artificial Pneumothorax in Pulmonary Tuberculosis. R. E. Mardis and R. G. Cowley.—p. 1883.
Acute Porphyria with Intestinal Carcinoma. C. D. Chaput and J. J. Timmes.—p. 1899.

FOREIGN

Acta Haematologica, Basel

7:1-62 (Jan.) 1952. Partial Index

*Study of Metabolism of Folic Acid and of Citrovorum Factor. K. Hausmann and K. Mulli.—p. 1.
Life Span of Red Blood Corpuscles in Erythronophthisis (Including a Method for Estimating of Fecal Stercobilinogen). H. S. Baar.—p. 17.
Radioactive Arsenic in Treatment of Hodgkin's Disease and of Mycosis Fungoides. L. Mallet, G. Marchal and G. Duhamel.—p. 27.

Metabolism of Folic Acid and Citrovorum Factor.—Citrovorum factor was given a therapeutic trial in 10 patients with pernicious anemia, 2 with symptomatic megaloblastic anemia, 3 with agranulocytosis, and 2 with idiopathic aplastic anemia. Two patients with pernicious anemia were given 6 mg. of synthetic citrovorum factor daily by mouth, but did not respond, and one who was given 9 mg. daily by mouth obtained only a suboptimal hematopoietic effect. In nine patients who were given 5 to 15 mg. of synthetic citrovorum factor daily intramuscularly the erythrocyte level was restored to nearly normal and the megaloblasts in the bone marrow disappeared. One patient was given a single massive intramuscular injection of 40 mg. of citrovorum factor obtained from bovine liver without significant effect on the hematopoiesis. One of the two patients with symptomatic megaloblastic anemia did not respond to the synthetic citrovorum factor, while the number of erythrocytes was restored nearly to normal in the other. The patients with aplastic anemia and agranulocytosis did not respond to the treatment. Microbiological assays of the urine following administration of folic acid and citrovorum factor directly into the colon showed little evidence of absorption from this organ, but following oral or parenteral administration the urinary output increased significantly. Folic acid in high doses was found to inhibit the growth-promoting effect of vitamin B_{12} on L. Leichmannii; high doses of citrovorum factor, thymine and thymidine did not exert such an antagonistic effect. Studies of the gastric juice of patients with pernicious anemia revealed reduced catalase and increased peroxidase activity; by an oxidative process the citrovorum factor is transformed to folic acid or to a substance similar to folic acid, while vitamin B_{12} and vitamin C are destroyed. These results may explain the pathogenesis of neurological symptoms and the favorable effect of antibiotics on pernicious anemia.

Annals of Rheumatic Diseases, London

10:393-536 (Dec.) 1951

Histopathology of Diarthrodial Joints in Ankylosing Spondylitis. B. Cruickshank.—p. 393.
Changing Pattern of Rheumatoid Arthritis. T. R. Littler.—p. 405.
Effect of Still's Disease on Haemopoietic System. B. Schlesinger and I. A. B. Cathie.—p. 412.
Hyaluronidase Spread and Effect of Salicylates in Rheumatic Fever. D. H. Atlas, P. Gaberman and H. Eisenberg.—p. 418.
Cortisone, Allergy, and Rheumatic Fever. D. A. Long.—p. 427.
Further Observations on Use of Pregnenolone in Rheumatoid Arthritis. G. N. Myers and D. N. Ross.—p. 432.
Ultrasoundwave Treatment of Chronic Disorders of Locomotor System. A. Sonnenschein.—p. 441.
Effectiveness of Different Forms of Heating. H. M. Whyte and S. R. Reader.—p. 449.

Arquivos de Neuro-Psiquiatria, São Paulo

9:303-392 (Dec.) 1951. Partial Index

*Arteriovenous Angiomas of Brain. E. Moniz.—p. 303.
Chronic and Acute Epiduritis. T. Insausti and R. F. Matera.—p. 324.
Rehabilitation in Neurosurgery. E. D. Rocca and F. A. Escardó.—p. 343.

Arteriovenous Brain Angiomas.—Moniz emphasizes the importance of cerebral angiography for the diagnosis and surgical treatment of arteriovenous angiomas of the brain and describes a new technique for the diagnosis of arteriovenous angioma of the carotid zone. It consists of the rapid passage of arterial blood containing the opaque substance into the upper longitudinal sinus through a large anastomosing vein. The parietal arteries yield the arterial blood to the anastomosing veins of the angioma. In a large number of cerebral arteriograms the author found only one such lesion, which was located in the rolandic region, diffusing itself into the parietal region. The patient complained of an acute pain in the left hip joint, which disappeared and was followed by hemiplegia that developed slowly for 48 hours. Jacksonian epilepsy and mental disturbances developed later. The symptoms, with the exception of hemiplegia, were due to disorders of circulation of the brain, with consequent transient or permanent ischemia in certain zones of the cerebral hemisphere. Hemiplegia in this case was due to a small hemorrhage from rupture of an angiomatous vessel. Fatal hemorrhage has been observed in other cases. The surgical treatment, as carried out by the author, consisted of ligation of the common carotid artery. Direct ligation of the angiomatous veins was successful in a case of angioma of the posterior temporal region that was deeply rooted in the brain tissues.

British Journal of Tuberculosis, London

46:1-80 (Jan.) 1952. Partial Index

Sir Robert Young. G. E. Beaumont.—p. 3.
The Place of the General Practitioner in the Tuberculosis Service. G. O. Barber.—p. 19.
Spontaneous Pneumothorax Resulting from Pneumoperitoneum Therapy. J. S. Jones and K. B. Yuill.—p. 30.
Pulmonary Adenomatosis. J. C. Valentine and N. Wynn-Williams.—p. 37.
Pneumoconiosis in Boiler Scalers. L. Dunner, M. S. Hicks and D. J. T. Bagnall.—p. 43.
Krukenberg Tumour Presenting as Pleural Effusion: Report of Case Simulating Meigs' Syndrome. P. Ellman and J. H. P. Johnson.—p. 60.

Glasgow Medical Journal

32:333-362 (Dec.) 1951

*Polycystic Disease of Kidneys and Intracranial Aneurysms. Etiology and Inter-Relationship of These Conditions: Review of Recent Literature and Report of Seven Cases in Which Both Conditions Coexisted. R. A. P. Brown.—p. 333.
Haematometra: Review of Literature with Clinical Illustrations. C. P. Douglas.—p. 349.

Polycystic Disease of Kidneys and Intracranial Aneurysms.—Polycystic disease of the kidneys and aneurysms of the intracranial arteries have both been attributed to congenital defects and their simultaneous occurrence is therefore of interest. Brown cites previous reports of the association of the two lesions and presents the history of a woman who had a subarachnoid and cerebral hemorrhage at 21 and who nine years later showed evidence of polycystic renal disease. There was no recurrence of hemorrhages despite development of hypertension. The autopsy reports of two Glasgow hospitals were then examined, and in 11,245 autopsies six cases of polycystic kidney associated with intracranial aneurysm were found. The relationship was present in 4% of cases of aneurysm and 16.6% of cases of polycystic kidney. It is concluded that polycystic kidneys and intracranial aneurysms are associated more frequently than would occur by chance. Although hypertension and vascular degeneration may play some part in the development of the aneurysms, it is more probable that there is a common etiology. Although coarctation of the aorta is more widely known as an associated finding with intracranial aneurysms, the association with polycystic disease appears to be more common.

Helvetica Medica Acta, Basel

18:559-648 (Dec.) 1951. Partial Index

Investigations on Renal Diabetes. F. Reubi.—p. 559.
Myocardosis in Hepatic Cirrhosis: Further Investigations. M. Oppenheim. —p. 573.
*Plasma Staining in Differential Blood Picture as Index of Dysproteinemia. H. R. Reufer and M. Schwarzenbach.—p. 578.
*Use of Nicotinic Acid in Disturbances of Cerebral Circulation, Particularly in Hemiplegia Following an Apoplectic Stroke. J. Mentha and J. Steponavicius.—p. 608.

Plasma Staining as Index of Dysproteinemia.—This paper is concerned with the staining of plasma observed in certain cases when differential blood counts are made. This phenomenon, which is designated as "film," was further investigated in 150 cases and three different intensities of film were detected. The following disorders were observed in patients whose plasma showed the staining or film: myeloma, acute and chronic leukemia, Hodgkin's disease, sarcoma, carcinoma, cirrhosis of the liver, macrocytic anemia, and chronic infections such as tuberculosis and isolated cases of reticulosis. There is considerable evidence that the film or increased uptake of dye by the plasma is the result of a quantitative shifting in the various protein components. The staining is more intense the more the quantitative ratio of albumin to globulin shifts toward globulin.

Nicotinic Acid in Disturbances of Cerebral Circulation.—If the vasodilating effect of nicotinic acid is to be utilized in the early stages of cerebral circulatory disturbances, the hemorrhagic should be differentiated from embolic, thrombotic, or spastic conditions. Nicotinic acid should not be used if there is hemorrhage. This paper describes the results obtained with nicotinic acid in 20 patients who had hemiplegia or hemiparesis resulting from cerebral hemorrhage, embolism, or malacia. In one, who had arteriosclerosis and a malacic focus, treatment with nicotinic acid was begun on the second day; in another patient administration of nicotinic acid was started on the sixth day after a cerebral hemorrhage. Both patients made good progress. Of the remaining 18 patients, 13 could be observed during a period in which they received the customary nursing care but no nicotinic acid, so that subsequent improvement during the administration of nicotinic acid can be ascribed to this medication. Ten of the 13 patients had a definite improvement in their active movements, whereas three showed no improvement. The other patients likewise showed improvement, which however cannot be definitely ascribed to the nicotinic acid therapy. Nicotinic acid did not prevent further apoplectic strokes, and it had no prolonged effect on the blood pressure. It caused no serious secondary effects.

Journal International de Chirurgie, Brussels

11:451-550 (No. 5 & 6) 1951

Surgical Treatment of Mitral Stenosis: Indications. E. Derra.—p. 451.

*Surgical Treatment of Massive Pulmonary Embolism. R. Benichoux.—p. 464.

Investigation of Microscopic Metastases in Parasternal Lymph Nodes in Cancer of Breast: Localization with Regard to Intercostal Spaces. E. Dahl-Iversen and B. Soerensen.—p. 492.

Management of Chronic Osteitis and Osteomyelitis with Coagulum of Autogenous Blood + Penicillin + Thrombin (On the Basis of Results in 56 Cases). L. Winter.—p. 510.

Pseudoarthrosis with Loss of Substance in Forearm: Treatment by Bone Grafts. W. Merino.—p. 525.

*Rheoangiography in Disturbance of Peripheral Circulation: Treatment and Evaluation of Efficacy. W. Kerschner and W. Mandl.—p. 536.

Trendelenburg's Operation for Massive Pulmonary Embolism.—Benichoux points out that although Trendelenburg performed the first embolectomy for massive pulmonary embolism 32 years ago, the indications for the operation are by no means clear. This study reviews 22 embolectomies performed in a Stockholm hospital from 1926 to 1949. Nine of the patients had been operated on for lesions of the digestive tract, three for gynecologic disorders, six for lesions of the limbs, three for urologic disorders, and one for hernia. Only nine of the patients had signs or symptoms that suggested that a massive pulmonary embolism might develop postoperatively. Since 1939 heparin has been employed in such cases at the Sabbatsberg Hospital, greatly reducing the morbidity and mortality rate of pulmonary embolisms. Use of heparin also helps to explain why only one of the series of 22 embolectomies has been performed since 1939. On the other hand, the deaths that have occurred since that time can be attributed to overconfidence in heparin therapy. All of the patients who died had been bedfast for long periods, but had been ambulatory for some days before the embolism occurred. Early ambulation is probably a factor in the decreasing incidence of massive pulmonary embolism. Progressive dilatation of the right heart is an important sign and is seen in every case of massive pulmonary embolism. A delay of more than 25 minutes before operative treatment may lead to a fatal outcome. The dilatation of the right heart is relieved by opening the pulmonary artery, and the embolectomy must be as complete as possible. Cardiac resuscitation and massage may be necessary, and controlled respiration with oxygen and carbon dioxide absorption is necessary until spontaneous respiration returns. Secondary pulmonary embolism after the first embolectomy is not infrequent, and some form of venous ligation may be necessary if thrombosis in the lower extremities is suspected, e. g., femoral ligation or tying the inferior vena cava. The author concludes that pulmonary embolectomy still has a place in the treatment of selected cases of pulmonary embolism and recent advances in vascular and thoracic surgery are of great assistance in such operations.

Rheoangiography in Disturbances of the Peripheral Circulation.—The method of rheoangiography described by Kerschner and Mandl measures the quantity of blood in the extremities. It is based on rheocardiography that registers changes in electrical conduction within the body. Rheoangiography registers the change in conduction that occurs when the pulse wave passes along the limbs, and in this way the blood flow can be measured. The conduction increases with the volume of blood per unit of time and falls when the local circulation begins to fail. The curves are measured in ohms or microohms. Values obtained with the aid of rheoangiography were compared with those obtained with the oscillometer and were almost the same. On the basis of 203 measurements, averages were ascertained for pathological, transitional, and normal cases. Case histories are presented to show the possibilities of rheoangiography for diagnostic purposes and for the control of standard tests. Finally the authors show how rheoangiography can be used to evaluate therapeutic results obtained with conservative treatment (injection of curare) or with surgical treatment (lumbosacral sympathectomy); special attention is given to the functional compensation that follows treatment of peripheral circulatory disturbances.

Lancet, London

1:61-112 (Jan. 12) 1952

Power and Responsibility. F. Fraser.—p. 61.

Prevention of Eclampsia and Pre-Eclampsia. R. H. J. Hamlin.—p. 64.

The Kidney of Scleroderma. H. C. Moore and H. L. Sheehan.—p. 68.

Slow-Release Medium for Adrenocorticotrophic Hormone. H. M. Bruce and A. S. Parkes.—p. 71.

Toxicity of Dihydrostreptomycin Sulphate for Auditory Nerve. C. Don and J. Gregory.—p. 72.

Regenerative Power of Liver and Its Reserve Capacity for Excreting Bile: Their Possible Significance in Surgical Treatment of Biliary Obstruction. L. Schalm, M. J. Schulte, H. R. Bax and others.—p. 75.

Accidental Spinal Injection of Xylocaine During Attempted Epidural Analgesia. D. D. C. Howat.—p. 81.

Treatment of Cardiac Arrest: Filling the Heart by Expelling Blood from Limbs. W. W. Woodward.—p. 82.

Semaine des Hôpitaux de Paris

28:39-78 (Jan. 6) 1952. **Partial Index**

"Water-Sodium-Potassium" Diabetes, Complicating Diabetes Mellitus. A. Lichtwitz, R. Parlier, D. Hioco and others.—p. 39.

*Treatment of Rheumatic Carditis with Intra-Arterial Injections of "Streptococcus Anavaccine." M. Debray, R. Wattebled, J. Bertrand and B. Malapert.—p. 51.

Treatment of Rheumatic Carditis.—Eighty-two patients with rheumatic carditis, 11 aged less than 16 and 71 aged over 16, were treated with intra-arterial injections of streptococcus anavaccine ("cardiostreptin"), i. e., a streptococcus vaccine preparation consisting of the microorganism, its lysate, and its anatoxin. The injections were made into the femoral artery distal to a tourniquet applied tightly enough to occlude the venous but not the arterial circulation. A total of 15 injections were given at intervals of three to four days up to the fifth injection, and then at intervals of five to six days. The first dose was 0.25 cc., the next two injections 0.50 cc., the fourth and fifth injection 0.75 cc. each, the next two injections 1 cc., and so on until a maximum of 2 cc. was given in one injection. The tourniquet was removed 15 minutes after the injection. The patients were placed on a light diet and two tablets of 0.5 gm. of acetylsalicylic acid were given every day on which an injection was made. Functional disturbances, dyspnea, and precordial or left interscapulovertebral pain increased occasionally between the second and fifth injection. Improvement occurred between the sixth and eighth injection, with increased diuresis and temperature restored nearly to normal. A slight temperature rise occurred frequently between the 12th and 13th injections and was followed by convalescence. Of the 11 children, 10 had severe acute carditis and 2 died in the course of the treatment. The others made a complete recovery from the acute attack of the disease for which they were admitted to the hospital. No adult died during treatment. Those with predominantly inflammatory lesions were considerably benefited, while improvement was less pronounced in patients with old cicatricial lesions. Results were particularly satisfactory in patients without preceding cardiac lesions, while results were moderate in patients with badly decompensated old valvular lesions, mitral stenosis, or severe disturbances of rhythm. Three of the latter patients died three, five, and seven months, respectively, after termination of the treatment. Of 42 patients, 15 were followed for four years, 8 for three years, and 19 for two years. They were able to lead a nearly normal life without taking any cardiac tonic or antirheumatic drug, and despite valvular lesions relapses of rheumatic carditis did not occur, even though before the treatment the majority of them had frequent recurrences and remained incapacitated. According to the authors, rheumatic fever is characterized by sensitization of the arterial system. Desensitization and vaccination should be carried out on this sensitized arterial tissue itself. The intra-arterial injections of "cardiostreptin" in the authors' patients extinguished the inflammatory process of rheumatic endomyocarditis, thus preventing development of a permanent lesion. Even long-standing valvular changes of mild degree were compensated by the return of the myocardial tonicity.

Strasbourg Médical

2:667-748 (Nov.) 1951. **Partial Index**

*Advantages of Streptomycin in Gonorrhea. R. Zorn and M. Michot. —p. 667.
Sensitization Dermatitis. P. Laugier.—p. 674.
Aging of the Skin. F. Woringer.—p. 696.
Treatment of Leg Ulcers. J. Grenier.—p. 716.

Advantages of Streptomycin in Gonorrhea.—Streptomycin is preferred to penicillin in the treatment of gonorrhea because it has little or no effect on the Treponema, and the likelihood that a concomitant syphilitic infection may be aborted, only to reappear later, is thus diminished. The danger of subsequent serious illness in patients treated for gonorrhea with penicillin is great, because very small quantities given during the period of incubation of syphilis will prevent the appearance of chancre without curing the infection. The danger might be avoided by prolonged observation, but these patients, embarrassed by their condition, are usually unwilling to submit to observation. Streptomycin in a total dose of 0.5 gm. to 2 gm., given in one or two intramuscular injections on one or two days has proved effective in 95% of the authors' cases of gonorrhea. It is safe and easy to inject, and has not been followed by any harmful effects because the period of treatment is short and the doses used are moderate.

Tidsskrift for Den Norske Laegeforening, Oslo

71:753-785 (Dec. 1) 1951

*Complications in Connection with *p*-Aminosalicylic Acid (PAS) Medication in Pulmonary Tuberculosis. S. Bøyum.—p. 753.
*Side-Effects in *p*-Aminosalicylic Acid (PAS) Treatment. P. Gundersen. —p. 756.
*Hypersensitivity to *p*-Aminosalicylic Acid (PAS): Report of Case. O. Kløvstad.—p. 759.
Motion Sickness and Its Treatment. O. Gulli.—p. 762.

Complications of *p*-Aminosalicylic Acid Treatment in Pulmonary Tuberculosis.—Bøyum's study of the cases of pulmonary tuberculosis treated with *p*-aminosalicylic acid in the Ringvål Sanatorium during the past two years showed that complications, although infrequent, may be grave in certain cases, with marked danger to the patients if the agent is not withdrawn at the right time. *p*-Aminosalicylic acid may exert a toxic effect on the liver, producing injury to the parenchyma and hypoprothrombinemia, and may affect phagocytes and thrombocytes. Hematuria and proteinuria were observed in two cases. The author recommends frequent leukocyte counts and urine analyses in patients receiving *p*-aminosalicylic acid. Prothrombin tests should be done before operation and in patients with a tendency to hemoptysis if this drug is to be administered. At Ringvål administration of *p*-aminosalicylic acid is now discontinued a couple of weeks before operative treatment and vitamin K given in prophylaxis.

Side-Effects in *p*-Aminosalicylic Acid Treatment.—A variety of complications following treatment with *p*-aminosalicylic acid have been reported. As a rule they occur in the first weeks of treatment. Gundersen says that the serious complications do not occur often, although they are reported in 5% of the cases in some series. Their gravity when they do occur suggests that patients treated with this drug should be more strictly observed than they have been heretofore. Regular examinations of the urine with respect to albumin, blood, and urobilin should be made. An exanthem or seemingly spontaneous rise in temperature should be taken as a prodrome of graver side-effects, and the treatment should be interrupted. If the symptoms are reproduced following a small test dose of the acid or its sodium salt, the treatment should be terminated; in cases with severer symptoms it is advisable to refrain from such testing. When complications are suspected the prothrombin content of the blood, bleeding time, coagulation time, and capillary resistance must be determined before operative treatment. Five cases are reported.

Hypersensitivity to *p*-Aminosalicylic Acid.—An initial rise of temperature may occur in patients who show a hypersensitivity reaction during treatment with *p*-aminosalicylic acid. When this agent is indicated a test dose of 4 gm. is advised, with determination of the temperature every other hour for the next 12 hours. Desensitization may be attempted in patients who react with increased temperature. Prophylactic preoperative treatment with vitamin K is advocated for all patients who have been treated with *p*-aminosalicylic acid. In the case described a hypersensitivity reaction occurred after 33 days of treatment, with an initial rise in temperature followed by a later rise, headache, exanthem, swelling of lymph glands, enlargement of the spleen, leukocytosis, lymphocytosis, eosinophilia, jaundice, urobilinuria and bilirubinuria, and positive thymol turbidity test. Cutaneous tests with the drug were negative. On readministration of the acid a rise in temperature, eosinophilia, and increasing thymol turbidity values were seen.

Urologia, Treviso

18:401-496 (Oct. 20) 1951

Pathology and Treatment of Hypospadias in Children. P. Romualdi. —p. 404.
*Treatment of 133 Cases of Ureterolithiasis with Procaine Hydrochloride Infiltration of Renal Pedicle. A. Trevisini.—p. 430.
Nephropathy Due to Carbon Tetrachloride: Experimental Contribution. R. Salmoni.—p. 442.
*Treatment of Cancer of Prostate with Ethinyl Estradiol. L. Migliardi. —p. 447.

Procaine Infiltration of Renal Pedicle in Ureterolithiasis.—In the last three years the author treated 133 patients with ureteral lithiasis by means of infiltration of the renal pedicle with 20 cc. of a 1% solution of procaine hydrochloride. In 69 patients with slight hematuria or infection, in whom disturbances had appeared one or two days before admission, the infiltration was performed during colic, and from one to three calculi, 5 mm. in diameter, were passed within a few hours or three days. In 12 patients, in 6 of whom the disturbances had been present for weeks or years, the infiltration was performed when colic was not present. The calculi passed some hours or two days later, and pains occurred only in the hypogastrium. Procaine infiltration during colic was ineffective in eight patients, six of whom had had symptoms for years or months, and the calculi were eliminated only after two to five infiltrations were performed when colic was not present. In 10 patients with a long history of frequent colics, ureteral catheterization was carried out when two to three infiltrations proved ineffective; the calculi passed two to three days later. In 11 patients, because of the anatomic conditions of the ureteral outlet, the block was followed by surgical diathermy. In seven the calculi were eliminated, while in three additional infiltrations were required, and the calculi passed without causing colic three days after the last infiltration. In one of these patients retrograde migration of the calculus from the ureteral outlet to the renal pelvis was observed after surgical diathermy. Infiltrations were repeated, and after one month the calculus was eliminated; it was assumed that surgical diathermy had caused antiperistalsis. In four patients repeated infiltrations had apparently no effect in that the calculi passed spontaneously 20, 28, 32, and 40 days, respectively, after the last block. Nephrectomy or pyelotomy was performed in four patients in whom two to three infiltrations were inefficient, and ureterolithotomy was performed in the other 15 patients in whom the treatment had failed because of the large size of the calculi. Thus, procaine hydrochloride infiltration of the renal pedicle alone was successful in 67.4% of the author's cases. The chances of success of this method in ureteral lithiasis decrease when the inflammation of the urinary tract is of long duration. The action of the anesthetic is not restricted to the ganglia and the nerves of the renal pedicle, but affects the kidney, the pelvis, and also, according to the author, the distal part of the ureter.

Ethinyl Estradiol in Cancer of Prostate.—Cancer of the prostate was treated with ethinyl estradiol ("eticiclina") in 37 patients, 21 of whom had undergone prior treatment. To three of these in whom estrogens of the stilbene series had failed, three to six 0.05 mg. tablets of ethinyl estradiol were given daily, but death occurred. In the other 18 in whom the previous treatment had good influence, 1 to 2 tablets were given daily for from several months to as long as one year. The general condition of the patients remained good, and the clinical findings, including metastatic lesions in three patients, remained stationary. Of the 16 patients who had not had previous treatment, those who were treated when their condition was still good received daily three to four 0.05 mg. tablets of ethinyl estradiol. This dose was decreased to 1 or 2 tablets daily when improvement occurred. A larger dose (8 to 12 tablets daily) was given to patients with poor general condition and severe disturbances of micturition, and this was also decreased to 1 or 2 tablets daily. Improvement in the clinical findings was quick and pronounced in all the patients, in some of whom it is still present after many months and in others after more than one year. In less than 20 days spontaneous urination was restored to normal in three patients in whom systematic catheterization had been necessary. In others dysuria decreased and residual urine disappeared. Swelling of the breast occurred in the patients during treatment, but toxic manifestations and signs of intolerance to the drug were not observed, even in cases in which massive initial doses of ethinyl estradiol were given.

Wiener medizinische Wochenschrift, Vienna

102:1-28 (Jan. 5) 1952. Partial Index

*Prognosis of Carcinoma of Colon. H. Finsterer.—p. 1.

Corticotropin (ACTH) and Cortisone Therapy of Bronchial Asthma. G. Holler, G. Kollert and O. Weinmann.—p. 5.

Origin of Adipose Tissue and Its Significance in Urology. K. Hutter. —p. 11.

Prognosis of Colon Carcinoma.—During World War II follow-up examinations of patients operated on for carcinoma of the colon could not be performed, and during the postwar years questionnaires were not answered by many patients who were living in foreign countries. The author's statistics are therefore concerned with 173 patients with carcinoma of the colon who were operated on during the period of 1910 to 1934 and were followed up to 1939. Of these 173 patients, 133 were subjected to resection, 27 to colostomy, and 13 to enteroanastomosis. Of the 133 patients, 29 died within the first six postoperative weeks. Of the remaining 104 who were discharged from the hospital as recovered, 6 were lost to observation, 10 died from intercurrent disease within the first five postoperative years, and 25 died within three years with symptoms of liver, peritoneal, or lung metastases. The remaining 63 patients (47.3% of those subjected to resection or 60.5% of the 104 who recovered) did not have recurrences for more than 5 and up to 24 years. Among those who recovered was a patient who was reoperated for recurrence after a two stage Mikulicz resection, and several patients who had been refused radical resection by other surgeons because of their advanced age and poor general conditions. From the prognostic point of view it is emphasized that of 12 patients operated on for colloid carcinoma, 9 did not have recurrences for more than five years, even though tumors of this type were considered inoperable by other workers. Carcinoma of the colon has the most favorable prognosis of the various types of carcinoma in men, and the next most favorable after that of carcinoma of the uterus in women. Consequently radical excision should be attempted even in apparently hopeless cases. Success of surgical intervention requires close cooperation between patient, family doctor, and surgeon. The patient must call on the family doctor when the first symptoms, such as increased constipation or discharge of blood and mucus in the feces, appear. The family doctor must insist on a series of gastrointestinal roentgenograms following oral administration of barium in addition to barium enema. The surgeon must perform the most radical operation that appears feasible under local anesthesia. Spinal anesthesia with a hypobaric solution of dibucaine (nupercaine®) hydrochloride is the method of choice. One stage or three stage resection should be preferred to two stage resection, the latter being resorted to only in cases of carcinoma of the right colon, with immediate removal of the tumor and the ileum sutured to the transverse colon to establish the "double-barreled" Mikulicz colostomy, followed later by crushing of the spur. Of 84 patients subjected to left hemicolectomy in one stage from 1910 to 1947, only 9 (10.7%) died. Of 332 patients on whom intraperitoneal anastomoses were performed up to 1948, only 5 died from breakdown of the anastomosis and resulting peritonitis, and that only because of erroneous indications. In the author's experience radical surgical intervention definitely increased the rate of permanent recoveries, despite the advanced age of the patients. Of 432 patients with carcinoma of the colon subjected to radical operation up to 1947, 91 were between the ages of 70 and 79, and 23 of them died (25.3%). Eleven patients were between the ages of 80 and 86, and four of them died (36.4%).

Zentralblatt für Gynäkologie, Leipzig

73:1827-1096 (No. 24) 1951. Partial Index

When Does Menstruation Begin Again Following Curettage? K. Rosenkranz.—p. 1827.

Uninterrupted Progression of Pregnancy Despite Curettage. H. Hartl. —p. 1832.

*Interruption of Pregnancy by Means of Hypertonic Solutions. H. Kallenbach.—p. 1845.

Treatment of Abortion with the Aid of Chemotherapy: Five Years Experiences. R. Häntsch.—p. 1847.

Interruption of Pregnancy with Hypertonic Solutions.—Legal processes may delay interruption of pregnancy until the pregnancy is rather advanced. In order to avoid the major operation that would be necessary under these circumstances, Kallenbach resorts to the technique described by Kovács. A 25% dextrose solution is introduced into the uterus by means of a rubber catheter; this is possible without dilatation of the uterine os. The amount of solution usually is equivalent to 100 cc. for each month of pregnancy, that is, 400 cc. for the fourth month. The fluid enters between the uterine wall and the fetal membranes. The increase in uterine volume corresponds to about that which the advancing pregnancy would produce in another month. There is little danger of uterine rupture, because the excess fluid flows off. The catheter is withdrawn after an adequate amount of fluid has been introduced. It is advisable, however, to place a tampon into the posterior vaginal vault. The uterine contents are usually expelled within 24 to 48 hours, and bleeding is generally not severe. Two factors are responsible for the elicitation of the uterine contraction: (1) the mechanical stimulus from the increased intrauterine pressure, and (2) the chemico-osmotic action of the hypertonic solution, which prolongs the effect. Physiologic solution similar to Tyrode's solution did not produce an abortion. A 10% solution of gelatin was tried and with this solution, the absorption is much slower, implying a greater mechanical action that evacuates the uterine contents, usually within 24 hours. Thus the gelatin solution was even more effective than the hypertonic dextrose solution. This method of inducing an abortion largely simulates the physiologic processes of a spontaneous delivery.

BOOK REVIEWS

Clinical Laboratory Diagnosis. By Samuel A. Levinson, M.S., M.D., Ph.D., Director of Laboratories, University of Illinois Research and Educational Hospitals, Chicago, and Robert P. MacFate, Ch.E., M.S., Ph.D., Chief, Bureau of Laboratories, Department of Health, City of Chicago. Fourth edition. Cloth. $12. Pp. 1146, with 221 illustrations and 13 plates. Lea & Febiger, 600 S. Washington Sq., Philadelphia 6, 1951.

Despite the many texts available on the subject of clinical pathology, this book remains the standard text in laboratory medicine. The book has been thoroughly revised and brought up-to-date. It has 269 more pages than the previous edition. Modern methods, which have proved to be valuable, have been added. Illustrations, many in color, with representative examples of the various types of blood dyscrasias, have been included in the chapter on hematology, and the new nomenclature adopted by the American Society of Clinical Pathologists is included in this section. Recent terminology is used throughout the text. The section on bone marrow has also been rewritten. In the discussion on blood groups and the Rh factor, a review including the technique for the determination of blocking antibodies and the Coombs' test is given. In the section on bacteriology, the latest classification by Bergey is included. There is a brief but adequate discussion on mycology as it is used in the clinical laboratory and a discussion on the methods for antibiotic study, including a screening method as well as a detailed survey of antibiotics. In the chapter on pediatric procedures, new illustrations and a report of blood dyscrasias in pediatrics as well as a review of the bone marrow findings have been included. Other sections that have been revised concern new nomenclature in tropical diseases, legal medicine and toxicology, the general search for poisons and the most important poisons, blood chemical methods, and the spectrophotometer (flame photometer) in relation to electrolyte balance studies. This last section should prove of value to the clinical laboratory, because the methods have been modified, so that the same reagents are used whether the product is read in the colorimeter or in the photometer. The authors describe the methods used in the colorimetric determinations and the way these may be converted from the photometer to the colorimeter or the reverse with only slight changes in technique and with no loss of time for the preparation of the new reagents. The usual biochemical methods are described, and there is a step-by-step description of the methodology. Among the chemical determinations discussed are ascorbic acid, alkaline and acid phosphatases, electrolyte balance studies, and sodium and potassium of the blood and urine.

The authors point out in their introduction that one of the major problems confronting a revision of a text in clinical pathology is the selection of current material and methodology of practical value. The progress in experimental medicine and clinical pathology has been rapid, and there is a tendency to include in texts more than is needed. The authors have achieved their objective in discussing the most useful methods in laboratory medicine in a concise, systematic manner. In most of the sections, there is a brief review of the basic sciences of anatomy, physiology, biochemistry, and related subjects, in order to assist the reader in the orientation of the subject as well as to benefit him in the problem of correlating the normal and abnormal findings.

The book is beautifully printed, and the illustrations are profuse and helpful. There are many plates, some of which are in color, and a 45 page index. It may be unqualifiably recommended to physicians, students, and medical technologists, as a succinct and authoritative text in clinical laboratory diagnosis.

History of Medicine in Ireland. By John Fleetwood, M.B., D.P.H. Cloth. 21s. Pp. 420, with 19 illustrations. Browne and Nolan, Limited, Richview Press, 41/42 Nassau St., Dublin, 1951.

Dr. Fleetwood, in this readable and interesting book, admits that his work is not an exhaustive account of Irish medical practice. He does, however, relate an historic narrative that traces the development of medicine in Ireland from the pre-Christian era to the present time. In discussing the Brehon Laws, which were first promulgated several hundred years before the time of Christ, he brings us from antiquity to the present day as he points out that provision was made in the Book of Aicill for a medical referee when a dispute over treatment arose between the patient and the physician. Payment to the physician was made by the aggressor in quarrels resulting in injury and was in accordance with the social class of the wounded person. The author indicates that, even in this period, some form of medical registration was practiced.

In a pleasant and interesting fashion, the author discusses the progress of Irish medicine through the years and relates the important developments in hospitals and teaching facilities. Physicians in the United States will find the final chapter, in which the author writes of the future of Irish medicine, especially interesting. He recognizes the complexity of the problem as more and more students overcrowd the medical schools and after graduation "leave the country forever—because it pays them better." The discussions of the activities of the medical education investigating committees in 1945, 1947, and 1948 and the author's comments are enlightening. Dr. Fleetwood favors a government program wherein two physicians are appointed to a district of 3,000 persons, with the patient having free choice of his physician, "even outside his district." Under this system, a physician might earn £1,626 per year. Although Ireland "can claim to as ancient a professional tradition as any other country," she will not, because of limited population, finances, and clinical material, find it easy to become a medical center. Ireland has given great men to medicine, but most of their contributions have been made in other countries. The bibliography is valuable. Those who are interested in the political problem that medicine faces in the United States will be able to appreciate the probable results of radical change in Ireland.

The Mode of Action of Anaesthetics. By T. A. B. Harris, M.B., B.S., D.A., Anæsthetist to Guy's Hospital, London. Cloth. $8. Pp. 768, with 22 illustrations. Williams & Wilkins Company, Mount Royal and Guilford Aves., Baltimore 2, 1951.

The object of this book is to reveal how anesthetics produce their characteristic action in man, since it is believed that a thorough knowledge of the mode of action of a drug ought, inevitably, to result in its intelligent use. This volume contains four sections, each section being divided into chapters. Section one deals with narcotics, section two with anesthetics, section three with the correlation of the level of anesthetic depression of the nervous system with anesthetic sleep, loss of sensation, and loss of muscle movement and tone, and section four with metabolism during anesthesia and the side actions of anesthetics. The author includes his own speculations and conclusions. An adequate bibliography at the close of each chapter makes this a valuable reference book. Apparently, this volume appeared before Brodie's report concerning the slow rate of metabolism of thiopental sodium due to its prolonged storage in fatty tissues of the body. Reference to this work would have enhanced the discussion of intravenous anesthesia. Many physicians believe that too early administration of morphine during anesthetic recovery, as recommended by the author, is an unwise procedure, particularly from the standpoint of hypoxia. The more extensive use of mask oxygen during recovery from general anesthesia has shortened

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The reviews here published have been prepared by competent authorities and do not represent the opinions of any official bodies unless specifically stated.

the excitement period and materially lessened nausea and vomiting. Spinal anesthesia has more wide acceptance and success than is indicated by the author.

The chapters are adequately illustrated with numerous tables, graphs, and mathematical formulas. A complete index is included. Consideration of the material discussed by this author makes obvious the wide knowledge a physician should have in order to provide safe anesthetic care. Anesthesiologists, research workers, and other physicians concerned with the effects of anesthetic drugs will greatly benefit from this book.

Primer for Pregnancy: An Informal and Practical Guide for the Expectant Mother. By Eve Stanton Featheringill. With foreword by Louis Langman, M.D., Assistant Clinical Professor of Obstetrics and Gynecology, New York University College of Medicine, New York. Cloth. $2.95. Pp. 241, with illustrations. Simon & Schuster, Inc., 1230 Sixth Ave., New York 20, 1951.

During the last few years many books concerning childbirth have been written by both physicians and lay persons. The author of this book is not a physician, but she is the mother of three children. She has acquired a considerable amount of knowledge concerning the psychological, emotional, and practical aspects of maternity. The book contains good advice, but the reviewer disagrees with sections of it; for example, the advice, "In a city, look in the classified telephone directory" for an obstetrician is not good.

The author is in favor of women being conscious during birth. Her first child was born while she was under an anesthetic, but not the second and third; she would not "trade the joy of the second and third for the oblivion of the first"; however, she believes that the use of final anesthesia is justified and often essential. Much time and effort has gone into this book. Whereas the author has really enjoyed her last two labors, perhaps by sheer will power, she will have a hard time convincing most of her readers that they will do the same. Nevertheless, the efforts of the author are to be commended, because any propaganda that will lead to a reduction of the present day excessive use of obstetric analgesia and anesthesia is definitely worth while. Many pregnant women will find this book useful and entertaining.

Gynaecological Endocrinology for the Practitioner. By P. M. F. Bishop, D.M. Second edition. Cloth. $3. Pp. 132, with 17 illustrations. Williams & Wilkins Company, Mount Royal and Guilford Aves., Baltimore 2, 1951.

Dr. Bishop's volume is an excellent, compact discussion of the commonest problems in endocrine gynecology. It is well written and contains much information. One of the admirable features is the fact that this is not a formal discussion, but it reflects the author's own experiences with patients and the application of sound scientific principles in this regard. The information is, therefore, most useful for the physician. There is an appendix with valuable suggestions on fertility case records, temperature charts during the menstrual cycle, tables of potency of estrogen, and therapeutic schedules. A minor criticism is that the excellent chapter on steroid chemistry is too extensive for this condensed volume. The space might be better used with other data. Otherwise, this volume can be recommended to the general practitioner and the gynecologist who wants a good basis for the study and treatment of the endocrine aspects of gynecology.

Yellow Fever in Galveston, Republic of Texas, 1839: An Account of the Great Epidemic. By Ashbel Smith, M.D., A.M. [Published by Hamilton Stuart, Galveston; Cruger & Moore, Houston; J. W. Cruger, Austin, 1839.] Together with A Biographical Sketch by Chauncey D. Leake, and Stories of the Men Who Conquered Yellow Fever. Cloth. $2.50. Pp. 135, with 3 illustrations. University of Texas Press, Austin 12, 1951.

In renaming its original structure in honor of Dr. Ashbel Smith, the University of Texas Medical Branch at Galveston provided the opportunity to reprint Dr. Smith's account of a yellow fever epidemic that occurred in Galveston in 1839. Dr. Smith, then a famous citizen of the Texas republic, obtained his B.A. and M.D. degrees from Yale University. When he received his B.A., the president of Yale said he was the best student of Latin and Greek that Yale had ever had. After Dr. Smith did graduate work in Paris, he began practicing medicine in the North Carolina hills. When a call came for volunteers to defend the Texas settlers, he made the long and rough journey to Texas, having been inspired by his friendship with the great Texas leader Sam Houston. He immediately undertook the care of the wounded and before long was appointed surgeon general of the Republic of Texas, later becoming secretary of state and the first minister of that republic to England and France. Following the admission of Texas to the Union, Dr. Smith was elected to the Texas legislature. Although opposed to secession, he raised the second Texas infantry and was its colonel. He remained active in medical affairs and took a leading part in fighting the Galveston epidemic in 1839, keeping records of cases and performing a surprising number of postmortem examinations. His clinical observations have been significantly improved on since then in only two ways: (1) by the recognition of mosquitoes as the transmitters of the infectious material and (2) by the recognition that yellow fever is caused by a virus.

This book is more than a reprint of Ashbel Smith's account of the Galveston epidemic. The editor, Chauncey D. Leake, includes the biographic sketch of Dr. Smith that was published in the *Yale Journal of Biology and Medicine* in January, 1948, and a series of articles edited by the late Josiah C. Trent that were published in 1946 in the *North Carolina Medical Journal.* These articles provide an excellent history of yellow fever and a discussion of the persons foremost in the battle to overcome its devastating effects.

Liver Disease. Consulting editor: Sheila Sherlock, M.D., F.R.C.P. Editor for Ciba Foundation: G. E. W. Wolstenholme, O.B.E., M.A., M.B. Ciba Foundation Symposium. Cloth. $4.50. Pp. 249, with illustrations. Blakiston Company (division of Doubleday & Company, Inc.), 1012 Walnut St., Philadelphia 5, 1951.

This book consists of a series of papers discussed at the International Conference on Liver Disease held in London and sponsored by the Ciba Foundation, in 1950. The subject of the conference was "Etiology of Chronic Liver Disease." Papers are divided into the following categories: protein metabolism in liver disease, etiology of hepatic cirrhosis, etiology of portal hypertension and ascites and its treatment, pigment metabolism, splenic blood flow, and infectious aspects of liver disease. Many of the papers are informal in character and involve work still in progress. The remarks of the various contributors are included verbatim. Tables, graphs, and photomicrographs are abundant.

The conference was attended and papers read by active investigators in the field from all over the world. The papers are stimulating and thought provoking and contain a great deal of unpublished material. This book should be read by all investigators interested in liver disease. Proper appreciation of this material, however, requires an extensive knowledge of the literature and of the technical procedures involved in studying liver disease. In addition, much of the material is presented in a fragmentary, unconnected fashion. Nevertheless, although this book is of interest chiefly to specialists, it is well organized and a real contribution.

Roentgen Anatomy: Roentgen anatomía. By David Steel, M.D. Cloth. $8. Pp. 109, with 108 illustrations. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill.; Blackwell Scientific Publications, Ltd., 49 Broad St., Oxford, England; Ryerson Press, 299 Queen St., W., Toronto 2B, 1951.

This neat, thin book contains 54 reproductions of roentgen films of the different parts of the human body in the usual standard positions. Opposite each roentgen reproduction is a line diagram of the same size, with every anatomic detail numbered, and, on the same page, the numbered part is identified in a listing. There is both an English and Spanish listing throughout the book. The cuts, printing, paper, and arrangement are characteristic of the meticulous artistry of the publisher. To review an anatomy book is like trying to review a dictionary; both are so factual that one often finds nothing to challenge. In the adult, human osseous anatomy is static in outline and detail if not altered by injury, disease, or age. The author, who is well known to American radiologists, is to be congratulated for providing, with simplicity, the primary facts of the interpretation of normal osseous shadows on roentgen films.

QUERIES AND MINOR NOTES

USE OF CORTISONE IN AMBULATORY PATIENTS

To the Editor:—*I practice in a poor district in which patients cannot afford expensive laboratory examinations, and they receive only a minimum of good medical care. Can cortisone be used safely and advantageously by ambulatory patients, and in what dosage and conditions?* *M.D., New York.*

Answer.—Cortisone may be administered with relative safety to ambulatory patients having most conditions for which cortisone is known to be useful, provided that the physician maintains proper supervision of the patients. The smallest effective dose should be used. No specific statement can be made regarding the size of doses, since this varies with the nature and acuteness of the disease and with the age and sex of the patient.

Prior to administration of cortisone, a thorough medical history, physical examination, roentgenogram of the thorax, urinalysis, leukocyte count, hemoglobin determination, and serologic test for syphilis should be performed. Other procedures may be indicated in special cases. During administration of cortisone, the physician should examine the patient periodically, with special regard for detection of undesired physiological effects. Initially, and whenever doses greater than 100 mg. are employed daily, such examinations are usually required every one to three or four days; later, examinations may be necessary only every one to two weeks, if daily doses of 75 to 100 mg. are used, or every two to six weeks, if daily doses less than 75 mg. are employed.

Laboratory tests are usually less important than clinical observation of the patient, in respect to proper regulation of dosage of cortisone. Urinalysis should be performed at intervals varying from one week to two or three months, depending largely upon the dose of cortisone administered. Hemoglobin and leukocyte determinations are required less frequently than urinalyses. Determination of blood electrolytes is usually unnecessary as a routine procedure, unless daily doses greater than 100 mg. are employed. Other laboratory examinations may be required by special circumstances.

The main contraindications to ambulatory therapy with cortisone are: 1. Illnesses that require rest in bed as part of the general program of treatment; for example, acute rheumatic fever. 2. Illnesses that by their critical nature require the close medical and nursing supervision that can be achieved only in the hospital. Crises of acute lupus erythematosus or acute adrenal insufficiency exemplify this category. 3. The presence of complicating conditions that increase the risk of administration of cortisone to such an extent that supervision in the hospital would be required for the patient's safety. The risk of administration of cortisone is increased in patients with psychosis or severe psychoneurosis, cardiovascular or renal insufficiency, diabetes mellitus, osteoporosis, peptic ulcer, pregnancy, convulsive disorders, and various infections. Even in the presence of some of these complications, hospitalization may be unnecessary. The risk of administration of cortisone must be evaluated individually for each patient.

ALCOHOLIC INTOXICATION

To the Editor:—*Is a male automobile driver who has consumed five alcoholic drinks during three hours capable of driving an automobile? Would this amount of liquor intoxicate this man?* *M.D., Illinois.*

Answer.—The degree of intoxication does not depend on the amount of alcohol that a person consumes but on the amount of alcohol that his body fails to oxidize or eliminate. In other words, it is the unburned alcohol in the body that causes intoxication. The average 150 lb. (68 kg.) man oxidizes and eliminates about 7 to 10 cc. of absolute alcohol per hour. If he would space his drinks, he could drink a pint of 100 proof liquor in 24 hours without showing physical or chemical signs of intoxication. The answer to the query is made difficult by the fact that absorption of alcohol is delayed by the presence of food in the stomach and that the dilution of the alcohol in the stomach is also a factor. Assuming that the query refers to a 150 lb. man of average build, and that each drink contains ½ oz. (15 cc.) of absolute alcohol, he would have consumed 2½ oz. (75 cc.) of alcohol. This amount could cause a maximal blood alcohol of about 0.12% by weight, if no oxidation took place; however, in the three hours of drinking he would oxidize about 1 oz. of alcohol, thus reducing the blood alcohol to a maximum of about 0.08%. From the standards set by the Committee on the Study of Motor Vehicle Accidents of the American Medical Association and the Committee on Tests for Intoxication of the National Safety Council, this would be interpreted as an amount that is usually associated with some loss of that clearness of intellect and self-control that he would ordinarily possess, but the obvious physical symptoms of the person should be taken into consideration before a diagnosis of intoxication is made. The unfortunate part of the calculations based on the amount consumed is that they can show a possible maximum blood alcohol, but the actual amount is usually unpredictably below this figure. The only reliable way to determine this man's state of intoxication would be to test the per cent of alcohol in his blood, breath, or urine.

ETHYLENE AND CYCLOPROPANE ANESTHESIA

To the Editor:—*What are the distinctive characteristics of ethylene and cyclopropane anesthesia?*
William E. Howes, M.D., Great Neck, N. Y.

Answer.—Cyclopropane and ethylene are similar in some ways but distinctly different in others. Both are gases and are obtained compressed in metal cylinders. However, the cylinders differ considerably; ethylene is packaged under much greater pressure and comes in heavy steel cylinders, while cyclopropane is packaged under low pressure and can be obtained in light steel cylinders. Ethylene has a rather strong characteristic odor, whereas cyclopropane has much less odor. The quantity of ethylene used usually is much greater than that of cyclopropane; the difference in odor is more noticeable partly for that reason. Both are inflammable and explosive when mixed with air or oxygen. With either gas one must use all precautionary measures, especially the Horton intercoupler. The boiling point of ethylene is -103.9 C (-155 F) and of cyclopropane -34.4 C (-30 F). The ignition temperature of ethylene is 543 C (1009 F) and of cyclopropane 498.9 C (930 F). The explosive limits of these gases are as follows: per cent in air, for ethylene, 2.75 in the lower limit and 28.6 in the upper, and for cyclopropane, 2.41 in the lower limit and 10.3 in the upper; per cent in oxygen, for ethylene, 3.1 in the lower limit and 79.9 in the upper, and for cyclopropane, 2.45 in the lower limit and 63.1 in the upper; per cent in nitrous oxide, for cyclopropane, 3.0 in the lower limit and 28.0 in the upper limit. The gas vapor density (when air = 1) for ethylene is 0.97 and for cyclopropane, 1.46.

Both gases must be used carefully to avoid the possibility of ignition by flame, cauterizing agent, or static electricity. Ethylene is administered with a gas machine. The continuous flow method or the carbon dioxide absorption technique may be used. Cyclopropane, being an expensive gas, is almost always given by the soda lime absorption technique. Cyclopropane with oxygen produces much more relaxation in anesthetic doses than does ethylene with oxygen. Use of cyclopropane usually is avoided in patients with cardiac disease, whereas ethylene is the anesthetic of choice in such patients. Ethylene is usually given in an 80% concentration with 20% oxygen, a mixture that tends to put it out of the explosive range. Cyclopropane is given

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The answers here published have been prepared by competent authorities. They do not, however, represent the opinions of any official bodies unless specifically stated in the reply. Anonymous communications and queries on postal cards cannot be answered. Every letter must contain the writer's name and address, but these will be omitted on request.

in low concentrations with a high percentage of oxygen; such a mixture does not put cyclopropane out of the explosive range nor does a similar mixture with nitrous oxide.

Each of these gases is administered advantageously with some diethyl ether, and each is complemented advantageously by the use of curare for producing relaxation. In goiter operations on patients with a high metabolic rate, adverse effects during emergence from ethylene anesthesia were observed in the days before Lugol's solution and more recent remedies were used in the preoperative preparation of these patients. The essential difficulty was that these patients required more oxygen than they received when given deep ethylene anesthesia. Cyclopropane has been used with better results in goiter cases because of the large amount of oxygen present in the inhaled mixture. However, patients with goiter often have cardiac difficulties, and for this reason cyclopropane is not generally considered indicated for this type of operation. For ordinary operations, such as laparotomy, cyclopropane has been used extensively, but occasionally when ether has not been used with it, the patient has shown alarming symptoms of cardiovascular collapse when anesthesia was discontinued. This reaction is called cyclopropane shock, or carbon dioxide absorption technique shock. It is controversial as to what mechanism is involved in bringing about this condition. It seems to be definitely associated with the technique of administering cyclopropane and oxygen without nitrous oxide and ether induction, and with administration of nitrous oxide and oxygen at termination of anesthesia. Patients go to sleep more quickly with cyclopropane than with ethylene, and they often awake more quickly from cyclopropane. In the postoperative period, there is usually little nausea or vomiting caused by either agent. The present day agents and methods of anesthesia permit one to utilize methods that are fireproof and explosion proof, that make it pleasant for the patient to be anesthetized, and that leave emergence from anesthesia free from nausea or vomiting. Ethylene and cyclopropane are being replaced more and more by these new agents.

CATARACTS AND DIATHERMY

To the Editor:—*I have seen reports of lenticular opacities secondary to Raytheon Microtherm irradiation on animals. The authors suggest there may be some tendency for the formation of cataracts from this type of treatment around the orbit. I would appreciate your opinion as to whether the use of deep heat (Microtherm) is dangerous when used around the orbit. Is there any type of shield that could be used over the eyes to protect the orbit from this heat and damage?*

M.D., Arkansas.

Answer.—There is a possibility of damage to living tissue due to excessive heating by diathermy. In the case of heating by microwave diathermy, there is special susceptibility of ischemic tissue, areas containing large amounts of fluid, and tissues overlying bony prominences to excessive doses. Lenticular opacities have been produced in experimental animals whose eyes were exposed to microwave diathermy.

From the experimental evidence available, it would seem possible that eyes subjected to excessive dosage may develop cataracts. One method of minimizing this danger is that of placing a metal cone over the eye to reflect the microwaves. A description of such a device is to be found in the paper entitled "Heating of the Human Maxillary Sinus by Microwaves" by Stafford L. Osborne and John J. Ballenger (*Brit. J. Phys. Med.* 13:177-180 [Aug.] 1950).

ANTABUSE® AND GENERAL ANESTHESIA

To the Editor:—*Would anesthesia be contraindicated for a patient who is taking antabuse®? How will such a patient respond to anesthesia?*

T. F. Brinton, M.D., Eugene, Ore.

Answer.—Patients taking tetraethylthiuramdisulfide (antabuse®) are not good candidates for anesthetization with any general anesthetic agent, because the drug interferes with utilization of oxygen by nervous tissues and because cardiac vascular complications might occur unless the administration of tetraethylthiuramdisulfide has been discontinued for some days before the anesthetic is administered. The administration of ether would be somewhat similar to the administration of alcohol to patients who are being given tetraethylthiuramdisulfide, since much acetaldehyde is formed, and this is the cause of the reaction. Paraldehyde, a polymer of acetaldehyde, must be avoided, since it causes a positive reaction to tests for acetaldehyde.

If a general anesthetic is administered, whether it be thiopental (pentothal®) sodium, curare, or cyclopropane, a high percentage of oxygen must be administered simultaneously. A great fall in blood pressure may be treated by the parenteral administration of fluids, particularly a 6% solution of "dextran" (6% dilution of polydispersoid glucose polymer) in an isotonic sodium chloride solution, a 3.5% solution of polyvinyl pyrrolidone in Tyrode's solution, and perhaps by the administration of a vasopressor agent. Unless the operation is an emergency, it would be better to prepare the patient for operation by discontinuing the administration of tetraethylthiuramdisulfide for several days.

DYSPNEA AND CHOKING SENSATIONS

To the Editor:—*A 33-year-old white man complains of dyspnea and a choking sensation in his throat. His electrocardiogram shows normal results, except for a slow pulse rate of 56. After exercise, his heart rate increases to 100 beats per minute but returns to normal in three minutes. His blood pressure is normal. His basal metabolism was +32 in one test, and, five days later, on another test it was +29. The protein bound iodine level was 5.5 μg. A roentgenogram of the chest shows normal results. His nose was operated on twice at the veterans hospital, with 100% improvement. Coffee and cigarettes cause mental confusion. The patient had three or four drinks recently and had an attack of tachycardia with shortness of breath. Is it possible that he has hyperthyroidism? Is the determination of the protein bound iodine level always as accurate as it should be? If this is not hyperthyroidism what factors would be responsible for this condition?*

A. L. Henrichsen, M.D., Van Nuys, Calif.

Answer.—A basal metabolism is a measurement of oxygen consumption and can be elevated by a number of conditions. Moreover, any laboratory error, such as a leak in the machine or the failure of the patient to be in basal condition, tends to raise the metabolism. Protein bound iodine levels may be abnormally high in the absence of hyperthyroidism when a patient has been taking iodine. Moreover, this test is difficult to perform, and final conclusions should not be drawn from a single test. In the complete absence of tachycardia or clinical evidence of hyperthyroidism, and, in the absence of goiter, one would be reluctant to make a diagnosis of hyperthyroidism. Moreover, the dyspnea and choking sensations are not characteristic of hyperthyroidism but are more often associated with functional states. It would not be surprising if this patient's disease were functional in origin.

CHRONIC ECZEMA IN A HOUSEWIFE

To the Editor:—*For two years I have been treating a 35-year-old woman for eczema of the hands and forearms. I have advised her to avoid the use of various soaps and washing powders, have prescribed several types of ointments, and have given the patient weekly injections of histamine in gradually increasing dosages. Could you advise me as to another type of treatment? The eczema had cleared up, and for no apparent reason it has flared up again, with deep cracks in the skin and severe irritation. I would like an opinion concerning the value of ethylene disulphonate in the above case.*

B. C. Kappmeyer, M.D., Hamilton, Ill.

Answer.—Ethylene disulphonate for the treatment of allergic diseases had a short vogue some years ago but passed into oblivion. It is difficult to advise regarding a case of chronic eczema of the hands in a woman doing housework. She may have simple irritant dermatitis from contact with substances too strong for her skin or from things to which her skin is hypersensitive. She may have nummular eczema that has been irritated, a so-called infectious eczematoid dermatitis, the id type of eczematoid ringworm, or eczematous psoriasis. A diagnosis should be established. In the meantime, the treatment should consist of soothing and protective measures, such as avoiding the use of possible irritating substances, wearing gloves for housework, and applying boric acid wet dressings when the dermatitis is acute and a borated cream or mild hand lotion when the acute phase has subsided.

DIABETES MELLITUS AND CORONARY DISEASE

To the Editor:—*A man, aged 70, after having attacks of angina for several years, had a small infarction in January, 1950. His recovery was uneventful, but, resuming his usual activities, he again felt substernal pain on exertion, which was relieved by rest or glyceryl trinitrate (nitroglycerine). In October, 1950, he was informed that he had sugar in his urine and that his blood sugar (fasting level) was 235 mg. per 100 cc. With dietary management alone, his blood sugar remained below 120 mg. per 100 cc. until November, 1951, when it rose to 154 mg. per 100 cc. He was advised to take insulin. Is this necessary, in view of his history and the apparent mild to moderate diabetes?*

M.D., West Virginia.

Answer.—In a diabetic patient with coronary heart disease, hypoglycemia should be avoided; however, satisfactory control of the diabetic condition should be brought about. Glycosuria should be minimal or absent, and the venous blood sugar should be kept in the general range of 130 to 140 mg. per 100 cc. in the fasting state and not over 200 mg. per 100 cc. after taking food. If this can be achieved by a diet, which, though restricted in carbohydrate and calories, allows for an adequate protein, mineral, vitamin, and caloric intake, then insulin need not be given; however, if this cannot be attained, insulin, in appropriate doses, should be prescribed, with care taken to prevent overdosage. For the patient in question, it is likely that 8 to 12 units of NPH insulin daily, before breakfast, would suffice. The diet should provide 150 to 200 gm. of carbohydrate daily and 1.0 gm. of protein per kilogram of body weight. The amount of fat should be kept low enough to avoid overnutrition.

ABDOMINAL PAIN AFTER AN APPENDECTOMY

To the Editor:—*A man, 37 years of age, strong and accustomed to strenuous work, underwent an appendectomy in 1946. He returned home from the hospital in a week but within a month began to have general abdominal pain, which was thought to be caused by postoperative adhesions. The pain became so intense, that he entered a hospital in February of this year. An operation was performed, and the adhesions around the site of the appendix were freed. Nothing abnormal was found. For a month he was free from pain; then the pain returned and is as intense as before. Has anything been discovered recently for the treatment of adhesions?*

John A. Ferguson, M.D., Wyckoff, N. J.

Answer.—It is possible that this patient originally had a regional ileitis. This nonspecific inflammatory disease of the ileum, usually in the terminal part, frequently results in attacks of right lower quadrant abdominal pain, sometimes without diarrhea. It is usual for such patients to have had an original diagnosis of acute appendicitis, resulting in removal of the appendix. Severe inflammatory reaction of the ileum with many adhesions is a common finding in such cases, and a number of adhesions apparent at a second operation would fit in with this diagnosis. It would be interesting to have an upper gastrointestinal roentgenogram and barium enema studies done on this patient to see what can be found in the gastrointestinal tract. It would be of interest to know the patient's general condition, his weight increase or decrease, the number of daily stools, and his health between attacks.

Occasionally, an exceedingly mobile cecum can cause recurrent attacks of right lower quadrant pain, probably at the time of a partial volvulus of such a structure.

HYPERTROPHIED BREASTS

To the Editor:—*Two years ago, a woman underwent a mastoplasty for hypertrophied breasts. Previously, she had two children, and with each pregnancy her breasts had become greatly enlarged, with little regression in size following delivery. She is pregnant again (two months), and enlargement of the breasts, accompanied by much pain, is again occurring. Can something be done to reduce the stimulation of the mammary tissue? Is androgen or estrogen therapy indicated, as in the treatment of painful breast engorgement occurring in the puerperium?*

M.D., Washington, D. C.

Answer.—The increase in the size of the breasts, with associated engorgement and pain, which occurs during pregnancy, is refractory to hormonal therapy. The only treatment suggested for the patient described is proper support for the breasts. After the third or fourth month of pregnancy, there will be little increase in their size. Therefore, if this period is uneventful as concerns damaging the effects of the mastoplasty, the patient may be reassured that no further complications will develop.

PARALYSIS FOLLOWING CEREBRAL THROMBOSIS

To the Editor:—*In* The Journal (147:1507 [Dec. 8] 1951) *Dr. Francesco Tansella of Bari, Italy, inquires about rehabilitation of the hemiplegic. The answer to this inquiry states that the only form of treatment of this condition is manipulation and massage. No definite program is outlined, and the answer ends by stating that it is questionable how much can be gained by instituting treatment a year after onset.*

We have reviewed 134 cases of hemiplegia treated at the Physical Medicine and Rehabilitation Service at Bellevue Hospital; the average age of the patient was 63 years. In this series, we were able to teach 93% of the patients the activities of daily living and ambulation, and one-third were able to return to some type of gainful work, although, in some instances, the hemiplegia had existed for more than a decade. I am enclosing a monograph from the Department of Physical Medicine and Rehabilitation, outlining the detailed management of the hemiplegic patient. I am taking the liberty of sending one of these directly to Dr. Tansella.

Howard A. Rusk, M.D., Department of Physical
Medicine and Rehabilitation
New York University-Bellevue Medical Center
477 First Ave., New York 16.

TESTS FOR CORONARY INSUFFICIENCY

To the Editor:—*In the Jan. 5, 1952* Journal, *in Queries and Minor Notes, a letter from Dr. Joseph Weinstein of Brooklyn states, "The frequency of false negative reactions, as well as the dangers involved in the use of the Levy anoxemia and exercise tests, has prompted the consideration of other tests." I infer that this statement applies to the Master test as well as the Levy test in the paragraph preceding the one just quoted. Physicians who use the Master "2-step" exercise test are disturbed by the repetition of the assertion that the test is dangerous. Not only is there no justification for this, but it is an allegation that I feel is used merely as an excuse for recommending another test in which the writer is interested.*

In thousands of tests personally observed by my co-workers and me in the office and clinic, there has never been a single untoward accident. Occasionally, perhaps, by pure coincidence, some patient may have an attack of acute coronary disease while walking on the two steps; however, there is no danger if the proper precautions are observed, i. e., performing the test only when the 12 lead control electrocardiogram is normal, always performing the single "2-step" before a double test is performed, and, finally, stopping the test if pain appears.

Simon Dack, M.D.
122 East 78th St., New York 21.

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AUTHORS	No. of Patients	Chronic, Resistant to Other Therapy	TYPES OF ULCERS				RELIEF OF SYMPTOMS (Chiefly Pain)				Surgery or Complications[1]	Side Effects Requiring Discontinuance of Drug[2]	EVIDENCE OF HEALING			
			Duodenal	Jejunal	Stomal	Gastric	Good	Fair	Poor	No Report			Complete	Moderate	None	No Report
Grimson, Lyons, Reeves	100	100	93	7			80	11	4		5		47		19	29
Friedman	15	15	14			1	5		4	6[3]			2			13
Bechgaard, Nielsen, Bang, Gruelund, Tobiassen	26	26	21			5	16	4	6				8	6	12	
McHardy, Browne, Edwards Marek, Ward	162		162				136	12	11		3	1	14	9	7	129
Segal, Friedman, Watson	34	34	34[4]				14	13			7	2	5		8	14
Brown, Collins	117	99	117				97	7	8		5	8	55	9	8	40
Asher	77		65		7	5	52	9	16			16		9	21	47
Rodriguez de la Vega, Reyes Diaz	5	4	5				4		1					3	2	
Winkelstein	116	116	102	8		6	102		14				53		18	45
Hall, Hornisher, Weeks	18	18	18				11		1	6[5]			18			
Maier, Meili	38	38	24			14[6]	27	7	4[7]				10	2	5	21
Meyer, Jarman	25	18	25				21		4							25
Poth, Fromm	37	37	37				33	3	1				33	3	1	
Plummer, Burke, Williams	41	41	41				36		5				38		3	
McDonough, O'Neil	104	100	104				63	10	31			11	4		11	89
Broders	60	60	58		1	1	35	19	6				10	1	49[8]	
Legerton, Texter, Ruffin	11		11				11									11
Holoubek, Holoubek, Langford	76	69	76				35	27	10		4	10	26		10	36
Ogborn	42		39	2		1	42[9]									42
Shalken	48	48	48				33	10	3		2		33	10	3	
Johnston	145	145	145				143		2			2	143		2	
Rossett, Knox, Stephenson	146		141			5	146					4[10]	53			93
TOTALS	*1443*	*968*	*1380*	*17*	*8*	*38*	*1142*	*132*	*131*	*12*	*26*	*54*	*552*	*52*	*179*	*634*
PERCENTAGES		*67.8*	*95.6*	1.2	0.6	2.6	81.3	9.4	9.3			3.7	*70.5*	6.6	22.9	

1. Not included in tabulations.
2. Included in "Relief of Symptoms" as "Poor" and in "Evidence of Healing" as "None."
3. Four had no symptoms when Banthine therapy was begun.
4. Of which seven were penetrative lesions and five partially obstructive.
5. No symptoms were present in four.
6. Two with symptoms only, no demonstrable ulcer.
7. Three were psychopathic patients and one had a ventricular ulcer of the lesser curvature.
8. *Roentgen findings after treatment period of two weeks; forty-seven had duodenal deformity.*
9. All returned to work within a week.
10. In these four, after relief of symptoms, Banthine was discontinued because of urinary retention.

During the past two years, more than 200 references to Banthīne therapy in peptic ulcer and other parasympathotonic conditions have appeared in medical literature. Of these reports, 22 have presented specific facts and figures on the results of treatment in a total of 1,443 peptic ulcer patients, 67.8 per cent of whom were reported as chronic or resistant to other therapy. These results are tabulated above and show:

"Good" relief of symptoms was obtained in 81.3 per cent of the 1,405 patients on whom reports were available.

"Complete" evidence of healing was obtained in 70.5 per cent of the 883 patients on whom reports were available.

In all but 9.7 per cent, relief of pain was "good" or "fair." In all but 22.9 per cent, evidence of healing was "complete" or "moderate."

During treatment, 26 patients required surgery or developed complications other than ulcer which required discontinuance of the drug before results could be evaluated.

Of the remaining 1,417 patients, only 3.7 per cent experienced side effects sufficiently annoying to require discontinuance of the drug.

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COST OF UNDERGRADUATE MEDICAL INSTRUCTION IN AN ENDOWED SCHOOL

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and
Wilburt C. Davison, M.D., Durham, N. C.

Stimulated by the analysis of the cost of undergraduate medical education in state-supported schools by President Wells of Indiana,[1] and his challenge that endowed medical schools also should publish their costs and not hide their budgets from the public, we have attempted this task for Duke University School of Medicine and Duke Hospital. A study of the costs of undergraduate medical education is especially important at the present time, since not only is a cooperative survey of medical schools being conducted by the Council on Medical Education and Hospitals of the American Medical Association and the Association of American Medical Colleges but also the possibility of federal financial assistance to medical education would require an accounting of present expenditures. Furthermore, all the schools, both state and privately endowed, are in financial straits.[2]

A third reason for compiling these figures is that the medical schools have a responsibility to keep the costs of undergraduate medical education fair and reasonable and either to justify the present expenditures or to reduce them. We quote President Hancher of Iowa: "All reasonable men wish the quality of medical education to be maintained at the highest level, and that the schools of medicine should have every dollar necessary to maintain medical education at that level, but not all reasonable men are convinced that the costs of medical education need be as high as they are. . . . Is the high cost of medical education necessary, and can it be proved?" [3]

Fourth, an analysis of costs is necessary in order to study the possibility of "more economies in medical schools" and of the "financing of hospital care and other community services," as suggested by the Commission on Financing Higher Education.[4]

To obtain the cost of medical education at state-supported schools, President Wells used the formula of the net amount contributed by the university, i. e., subtracting from the total expenditures of the school and hospital all collections from patients and all other sources, except those from medical students. As the tuition fees went into the general fund, they were not subtracted from the total costs. On the basis of that formula, the annual net total costs of the medical schools at state universities varied from $200,000 to $1,100,000, with a mean of $600,000. Tuition at the state schools averaged 15% of the costs.[1]

That method of calculation is easy, because every university treasurer knows at the end of the year to his sorrow, and sometimes unexpectedly, the exact amount of the annual expenditures of the medical school and its teaching hospital. On that basis, the annual net total costs to the university can be obtained by subtracting the receipts from outside teaching and research grants, collections from patients, gifts from foundations, and the like (table 1). The annual net cost per undergraduate medical student is then calculated by dividing the above remainder by the number of undergraduate medical students enrolled in that year (table 2). However, Dietrick has emphasized [5] that the results obtained by this formula do not represent the true "basic operating expense" of medical education [6] and are misleading and meaningless. As will be pointed out later, these cost figures include many services to the public, some research

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From the Department of Pediatrics, Duke University School of Medicine and Duke Hospital (Dr. Davison).

[1] Wells, H. B.: State Funds in Support of Medical Education, J. A. Am. M. Coll. **22**: 155-159 (May) 1947.

[2] Valentine, A.: The Privately Endowed Medical Schools; Their Present and Future Financing, J. A. M. A. **137**: 1-5 (May 1) 1948. Brown, M. C.: Medical School Financing in Theory and Practice, South. M. J. **42**: 793-801 (Sept.) 1949. Rusk, H. A.: Lack of Funds Threatening Medical Education of Nation, New York Times, May 27, 1951, p. 36.

[3] Hancher, V. M.: The Social Responsibilities of Medicine, J. A. Am. M. Coll. **25**: 81-89 (March) 1950.

[4] Financing Medical Education, New York, Commission on Financing Higher Education, May, 1951.

[5] Deitrick, J. E.: Reporting for the Survey of Medical Education, Meeting of Association of American Medical Colleges, Lake Placid, N. Y., Oct. 24, 1950.

[6] Surgeon General's Committee on Medical School Grants and Finances: Financial Status and Needs of Medical Schools, A Preliminary Report, Public Health Service, Federal Security Agency, 1950.

expenses, and the expense of the instruction of nonmedical students, which should not be charged to undergraduate medical education.

On the basis of the formula used by President Wells [1] and the Surgeon General's committee,[6] the annual net total costs at Duke have varied from $305,368 in 1933-1934 to $891,356 in 1946-1947 (table 2). Exclusive of the relatively higher expenses in 1930 when the school was opened, the annual net cost per undergraduate medical student, calculated on this erroneous basis, has ranged from $1,582 in 1933-1934 to $3,626 in 1947-1948 (table 2). The causes for this fluctuation will be discussed later. In 1947-1948, the tuition paid by the undergraduate medical students represented 18% of this figure, but in 1950-1951, owing to higher tuition and lower net total costs, it was 33%.

TABLE 1.—*Expenses and Revenue, 1947-1951, Duke University School of Medicine and Duke Hospital*

Item	1947-1948 (Actual)	1948-1949 (Actual)	1949-1950 (Actual)	1950-1951 (Actual)
Expenses: School of Medicine *	$ 728,460	$ 747,689	$ 732,231	$ 744,861
Expenses: Duke Hospital	2,202,165	2,387,078	2,449,507	2,777,668
Expenses: Total	2,930,625	3,134,767	3,181,738	3,522,529
Less: Collections from patients, outside teaching grants, etc.*	—2,078,541	—2,456,762	—2,678,608	—2,845,124
Annual net total cost *	852,084	678,005	503,130	677,405
(Annual net cost per undergraduate medical student) †	(3,626)	(2,439)	(1,784)	(2,192)
Subsidy from Duke University	700,284	467,505	283,380	453,905
Tuition paid by undergraduate medical students ‡	151,800	210,500	219,750	223,500

* Not including approximately $300,000, annually, in research expenses paid by additional outside grants. The tuition paid by the students has not been subtracted from these cost figures.

† The annual net total costs divided by the total number of undergraduate medical students (235 in 1947-1948, 278 in 1948-1949, and 282 in 1949-1950). The size of each entering class is 76. The small number of students in 1947 was due to the hiatus caused by return to the peacetime voluntary accelerated program from the wartime compulsory schedule. The differences in 1948 and 1949 are due to differences in the number enrolled in the voluntary accelerated summer quarter.

‡ Tuition at $200 per quarter, or $600 per academic year of three quarters, in 1947-1948, which was increased to $250 per quarter, or $750 per academic year of three quarters, in 1948.

The recently published estimate of medical teaching costs at another endowed school (table 3) shows a somewhat similar annual expense per undergraduate medical student ($3,339), on the basis of the hourly costs with the total net expenses charged to the undergraduate medical students.[7]

In the preliminary report of the Surgeon General's committee, covering the 72 four-year American medical schools, the median annual net total expense, after deduction of all income from patients was $509,970, with a range from $381,543 to $782,654.[6] The median figure obtained by dividing the annual net total expense by the total number of undergraduate medical students was $2,285, varying from less than $1,500 to over $3,500. The tuition paid by the undergraduate medical students was 23% of these expenses (median), with a median percentage of 17 in publicly supported schools and of 27 in endowed schools.

It is no wonder that "not all reasonable men are convinced that the costs of medical education need be as high as they are." [3] As a matter of fact, they are not as high as indicated by the figures in tables 1, 2 and 3. These amounts, accurate as they are, fail to tell the whole story, but university presidents [8] and medical deans [9] still believe that the median annual net cost of educating an undergraduate medical student is in the neighborhood of $2,500. University faculties and trustees and all other members of the tax-paying and endowment-contributing public should be told of the numerous services, in addition to medical education, that they are receiving from the funds that are erroneously charged totally to medical education.

There are at least six factors that should be considered before the cost of medical education can be understood or justified, or even reduced.

1. NEED FOR A UNIFORM ACCOUNTING PROCEDURE

The first factor is the great need for a uniform accounting procedure for medical schools and teaching hospitals. When the first Duke budget was set up, in 1930, the budgets of three other medical schools were studied, but only by repeated correspondence and interviews could any comparable figures be obtained. Although the results of that intensive study, as well as of this present one, show the amounts spent, they do not give a correct cost analysis, either comparatively with those of other institutions or for our own. For example, part of these costs, although they may be considered as integral and essential factors in teaching, should be

TABLE 2.—*Cost of Medical Education When All Annual Net Total Costs Are Charged Only to the Undergraduate Medical Students*

Year	Net Total Cost *	Total No. of Undergraduate Medical Students †	Annual Net Cost per Undergraduate Medical Student
1930-1931	$322,211	70	$4,605
1931-1932	403,119	144	2,799
1932-1933	388,442	165	2,354
1933-1934	305,368	193	1,582
1934-1935	434,950	210	2,071
1935-1936	471,511	217	2,173
1936-1937	472,744	241	1,962
1937-1938	512,005	244	2,098
1938-1939	610,478	256	2,385
1939-1940	646,307	259	2,495
1940-1941	662,035	262	2,527
1941-1942	603,544	262	2,304
1942-1943	519,110	266	1,951
1943-1944	500,102	302	1,656
1944-1945	621,155	296	2,098
1945-1946	766,233	282	2,717
1946-1947	891,356	290	3,074
1947-1948	852,084	235	3,626
1948-1949	678,005	278	2,439
1949-1950	503,130	282	1,784
1950-1951	677,405	309	2,192

* Over and above receipts from outside teaching and research grants, collections from patients, gifts from foundations, etc. The tuition paid by the students has not been subtracted from these cost figures. For calculations, see *table 1*.

† The fluctuations in the total number of undergraduate students are due to the differences in the number admitted each year (50 to 68 annually from 1930 to 1941, 76 every nine months during the war, and 76 annually thereafter), and to differences in the number enrolled in the voluntary accelerated summer quarter.

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[7] Medical Education in the U. S. A.: The Problem, The Cost, The Target, National Fund for Medical Education, Inc., 1950.

[8] Wells.[1] Valentine.[2] Hancher.[3] Footnote 4.

[9] Footnotes 6 and 7.

[10] At other universities, this overhead has varied from 11.5% to 45%, with an average of 27%. (Weaver, H. M.: A Formula to Determine the Cost of Research, J. A. Am. M. Coll. **25**:248-254 [July] 1950).

charged to the following research, instructional, and other services, and not solely to the teaching of undergraduate medical students.

(*a*) *Research.*—Although the outside research grants are not included in the costs in tables 1 and 2, the added expense of such items as material, structural and building changes, maintenance and upkeep, and ancillary personnel, has been calculated to be 38% of the salaries and wages,[10] or approximately 32% of the total expenditures. As most of the outside grants carry only 8% overhead on the total, the remaining 24% should properly be considered part of the institution's contribution to outside sponsored research and should be deducted from the net cost of medical instruction. In 1950-1951, for example, these outside research grants totaled more than $300,000 and this 24% amounted to over $72,000. It should be pointed out that, in addition, the medical school made other substantial contributions to this research program, in the way of supervisory personnel and even principal investigators, but the amount of this contribution is not as easily computed as the indirect costs. Furthermore, it is quite justifiable to deduct the entire 24%, because the university budget already includes funds for the "normal" research program that is essential to satisfactory medical education,[11] whereas this 24% applies only to that "extra" research that is of more value to medicine in general and to society than to medical education. In fact, in some schools, this "extra" research, instead of aiding medical education, actually interferes with it by keeping members of the senior faculty so busy that many of them have lost contact with the students.[12]

TABLE 3.—*An Estimate of Medical Teaching Costs (1947-1948) at Another Endowed Medical School, Based on Charging All of the Annual Net Total Costs to the Undergraduate Medical Students* *

Years Taught	Subject	Total Teaching Hours per Undergraduate Medical Student	Hourly Teaching Cost † per Undergraduate Medical Student	Total Teaching Cost † per Undergraduate Medical Student
1st............	Anatomy	704	$1.73	$1,219
1st............	Biochemistry	242	3.14	761
1st, 2nd.......	Bacteriology	154	3.90	601
1st, 2nd.......	Physiology	253	3.14	794
4 yr...........	Psychiatry	181	7.50	1,358
2 yr...........	Pathology	330	2.81	929
2nd, 3rd.......	Pharmacology	132	3.61	477
2nd, 3rd, 4th..	Medicine	932	2.18	2,034
2nd, 3rd, 4th..	Surgery	679	2.63	1,824
2nd, 3rd, 4th..	Obst. & Gynec.	530	2.60	1,382
2nd, 3rd, 4th..	Pediatrics	246	4.41	1,085
2nd, 3rd.......	Public Health	176	3.67	646
2nd............	Radiology.	11‡	2.36	246
		4,570	$3.14§	$13,356‖

* Medical Education in the U. S. A.[7]

† Actual expenditures for all professional and nonprofessional salaries, supplies, and administrative and maintenance expenses. Hospital and intern and resident costs or outside research grants are not included. The tuition paid by the undergraduate medical students, which represents 21% of the costs, was not subtracted from the total cost.

‡ Additional hours included in other subjects.

§ Mean.

‖ Total per undergraduate student for the four-year course; $3,339 annually per student.

(*b*) *Hospital Charity Costs.*—The hospital charity costs, that is the difference between the cost of hospital care and the amount the patients pay, which usually exceeds $100,000 annually at Duke,[13] should be deducted from the university subsidy and charged to the community whose patients have been benefited by the medical care. Despite a popular belief to the contrary, the cost of operating a teaching hospital is no more than that of any other good hospital. For example, last year's daily patient cost at Duke Hospital of $14.20 was exceeded by some nonteaching hospitals in the state. Local communities pay in full the difference between costs and collections in nonteaching hospitals, and there is no reason why they should not do likewise for a university teaching hospital. Furthermore, an intern's maintenance and a resident's salary are hospital expenses and should not be charged to medical education.

(*c*) *Professional Services to the Indigent.*—Professional service to the indigent is one of the greatest benefits to the public from the funds that they mistakenly believe are entirely spent for medical education. If a small charge for the highly skilled medical, surgical, obstetric, and pediatric care of the patients who cannot pay for these professional services were paid by the community and deducted from the university subsidy to medical education, the annual net costs would be greatly reduced. For example, in an average year at Duke, the community should reimburse the university for the examination of each of the 95,000 annual outpatients and the 8,000 inpatients and for the daily professional treatment of these public ward (not private) patients, who spend 90,000 patient-days in the hospital.

If we use the year 1948-1949 as an average year and reduce the net total cost of $678,005 (tables 1 and 2) by $72,000, which is chargeable to research, and by $18,945 (the hospital operating deficit for that year),[14] which is chargeable to charity, we have an adjusted cost figure of $587,060, which would represent the true net cost of medical education.

(*d*) *Distribution of the Net Costs to Teaching of Ancillary Personnel.*—Distribution of the net cost to the teaching of ancillary personnel, an important contribution that Deitrick has made to this problem,[5] emphasizes the need for a uniform accounting for medical schools. For example, in 1948-1949, the $587,060, which was the true net annual cost of medical instruction (see preceding paragraph), should be distributed not only to the education of the 278 undergraduate medical students but also to the training of the 141 student nurses, 12 dietetic interns, 58 students in ancillary medical fields (6 in anesthesiology, 11 in physical therapy, 5 in medical record science, 3 in laboratory technology, and 5 in x-ray therapy), and 229 interns, hospital administrative students, residents, and fellows,[15] who are just as truly graduate students as those in academic graduate schools. These 440 nursing, dietetic, technical, and graduate students, *in addition* to the 278 undergraduate students, make a grand total of 718. All of these 718 students, not to mention the hundred or more physicians who attend the Duke five-day semiannual postgraduate refresher courses, are taught by the same faculty and with the same equipment and budget, so that it is logical to divide the annual net total costs, not by the 278 undergraduate medical students, but by 718, the total of all who were receiving medical, nursing, dietetic, and technical instruction. It might be argued that these 440 residents, fellows, and nursing and technical students should not be given the same weight in the calculations as the undergraduate medical students, on the ground that the undergraduate medical students pay more tuition than the others and therefore are given more instruction, an accusation that is far from true. No one would deny that the cost of instruction should be distributed over all students who are being taught by the medical school faculty, but, as we point out later in discussing the variations in the hourly teaching cost per instructor and per department of the medical school, it is impossible to give the same weight to the teaching costs in any department in any year. At times, the instructional costs for nurses and technicians, even after giving credit for the service they render, is actually higher than that for medical students, while at other times of the year, especially while the medical students are on vacation, this teaching might be considered a by-product. In addition, the same quality of equipment is necessary in order that students may be taught to use it as well as to take care of it. However, we realize that there is almost as much danger of error and misleading conclusions in giving the same weight to all students as in failure to distribute teaching costs to all of the ancillary student personnel. Again, the need of a standard accounting procedure is emphasized.

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[11] Obviously research is necessary for good medical education in order to stimulate the staff and students (Davison, W. C.: The Future of Medical Education, J. A. Am. M. Coll. **21**: 223-235 [July] 1946), but some accounting yardstick is necessary to determine the optimal or "normal" amount per student or faculty member, which should be provided by university funds. Some years ago, Dr. Lewis H. Weed and one of us tried to calculate the percentage of the Johns Hopkins budget used for this "normal" research and "guessed" that it was between one-third and one-half of the total. The situation at Duke is similar, so we therefore assumed that the funds in the present university budgets (table 1) at least represent the minimal amount of research support needed for good teaching and that the unpaid portion of the overhead for the "extra" outside research funds should not be charged to medical education.

[12] Davison, W. C.: Returning the Faculty to the Students, to be published.

[13] The annual net deficit of Duke Hospital has been as high as $302,531.

[14] This abnormally low operating deficit was due to unexpectedly better collections from patients, insurance carriers, welfare agencies, and the like, and lower expenses owing to inability to find the nurses, technicians and other employees who had been included in the budget.

Comment.—On this logical basis of dividing the true annual net cost of $587,060 by 718 students, the annual net expense per student in 1948-1949 would be $817.63 instead of the $2,439 based on charging all of the annual net costs only to the 278 undergraduate medical students. It might be argued that, by including these 440 residents, fellows, and nursing and technical students in the denominator, we should also increase the net total cost by the tuition paid for these groups. In the average year under consideration, such payments amounted to $98,080; the cost would then be $685,140 and the net annual cost per student $954.23. If these calculations were based on the lower subsidy in 1949-1950, the net annual cost per student would be $600.46 and $705.48, respectively. These amounts could be reduced still further by more efficient and continuous use of laboratories and classrooms in an accelerated program of three years of 11 months each.[16] However, when the figures as they stand are used, it becomes apparent that the undergraduate medical student is sharing jointly with the university the expense of community services for which the public should reimburse the university.

Of course, the joker in this analysis is that the community does not pay its share, so that the higher expenses as shown in tables 1, 2, and 3 are considered to be the cost of undergraduate medical education. By showing "who should pay what," we hope that an enlightened public may recognize and pay for these community benefits and not continue to force the university to carry expenses that are not educational. The public needs to be informed of the services being provided over and above medical education by their institutions, and for this purpose the analysis of the distribution of costs that we have just given should be used instead of the usual formula for determining the expense of medical instruction.

2. AIM OF THE SCHOOL

The second factor to be considered in the cost of medical instruction is the aim of the school, i. e., whether the teaching is strictly utilitarian, as in a high school, or whether the faculty and students engage in research, as in a university. The latter has been the policy at Duke, as shown in the following statement by Dr. W. D. Forbus:

> Duke University School of Medicine, from its beginning in 1930, has maintained as its major objectives: (1) the cultivation and teaching of medicine on a strictly scientific basis; (2) the correlation of medical research with medical teaching at all levels of its instruction; (3) the continuous search for and experimentation with new or improved methods of teaching scientific medicine; (4) academic appointments, promotion and tenure are contingent upon satisfactory research interest and accomplishments; (5) all encouragement possible is given to the development of research interest and talent in the medical students, as well as in staff members, by maintaining research fellowships for medical students and offering an academic degree to medical students who complete acceptable research while in medical school; and (6) the school contributes toward the support of research from its own funds, makes all possible effort to supplement its own funds from outside sources, and encourages every research worker to pursue his own field of activity.

To this statement of the aims of the school, must be added the responsibility for providing more general practitioners, especially in rural areas.

3. TYPES OF MEDICAL FACULTIES

Medical faculties are of three types: strictly full-time, geographic full-time, or part-time and the proportions of each greatly affect the cost as well as the quality of medical instruction. A completely full-time staff, as at Johns Hopkins, Billings in Chicago, Mayo Clinic, and Ford Hospital, was the plan originally considered for Duke. It would have enabled the members of the faculty to give their full time to the training of students and research. The number of private patients, judging by the experience at Johns Hopkins, would be small, and their fees would have gone to the university. However, Drs. Harvey Cushing and Henry A. Christian, of the Harvard Medical School, with whom the policy was discussed, recommended the Harvard or geographic full-time program, on the grounds of the large budget needed for salaries under the Johns Hopkins and Billings full-time type of program and the possibility that private patients might be treated perfunctorily if the profit motive were eliminated. After all, a private patient, as well as a public ward patient, should have the benefit of a university medical faculty. A combination of strictly full-time, geographic full-time, and part-time was therefore adopted at Duke. All of the preclinical faculty and one-third of the clinical staff are on strictly full-time, with the remainder of the 92 full-time members of the faculty on a geographic basis. In addition, there are 34 instructors on a part-time schedule; some are residents, a few have offices in Durham and surrounding towns, and others work in two departments, for example, in medicine and physiology, neurology and anatomy, and pediatrics and biochemistry. Most of the instruction is done by the full-time staff, but that of the part-time group, though less in hours, is indispensibly valuable.

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[15] An average figure since the war; there were 245 in this group in 1950-1951.

[16] Markee, J. E.; Harris, J. S., and Davison, W. C.: Programs to Provide More Physicians, J. M. Educ. 26:437-445 (Nov.) 1951.

The strictly full-time faculty members receive salaries comparable with those of equal grades in similar institutions, but no income from private patients. The members of the geographic full-time faculty are paid smaller salaries, have their offices in the hospital, and may treat as many patients in the hospital and private diagnostic clinic as they wish, as long as their private practice does not interfere with their primary duties of instruction and research. Fees from these private patients are collected by the business managers of the private diagnostic clinic. Part of the gross income of this clinic covers the overhead of managers, secretaries, and technicians; part is used for research work by the departments concerned; part goes to the university building fund in lieu of rent; and the remainder is divided among the members of the geographic full-time faculty in proportion to the amount of work done by each member.

4. VARYING SUBSIDIES

Probably the greatest financial difficulty in analyzing the cost of medical instruction is the varying subsidy required to cover the difference between the expense of operating a teaching hospital and the amount collected from patients. Regardless of whether the university or a governmental body pays this subsidy, it is an expense that should be borne by the community whose patients are benefited by the improved medical service in a teaching hospital. In the preparation of budgets, there is nothing uncertain in regard to three of the four major items, namely, the medical school expense, the hospital costs, and the amount of tuition. They are readily predicted. The first fluctuates with the cost of living, though every instructor knows that there is a considerable lag in the process. The hospital costs, as shown in table 1 for 1947 to 1950, usually climb. The tuition has now been raised to a figure that probably is stable unless there is further inflation. On the other hand, collections from patients are often unpredictable. In spite of rate increases, hospital income usually fails to keep pace with the greater rise in the costs of operation, though the extent of the difference between patient costs and patient collections is a great variable. In 1947, for example, the average daily patient-cost at Duke Hospital was $12.36 and the average daily collection from all patients was $10.12 [17]—a daily average loss of $2.24 per patient, which represents a contribution by Duke University to the charity medical care problem—a load that, as previously stated, should be carried by the community. In 1948, the daily costs had risen to $13.38 and the collections to $10.38, making the Duke University subsidy to North Carolina medical charity $3 per patient-day. However, in 1949, though the daily hospital costs had risen to $14.20, the collections had increased to $11.70 per day, and the university contribution was reduced to $2.50 per patient-day.

The wide differences in the net total costs in table 2, varying from $305,368 in 1933-1934 to $891,356 in 1946-1947, indicate the difficulties one encounters in trying to arrive at a stable net cost figure for medical instruction. In no other field of higher education will the net costs vary so much, regardless of enrollment. These fluctuations are mainly due to variations in hospital collections, as well as in foundation and governmental grants. The primary factors affecting these net costs are economic conditions. They determine the collections from patients, and the expenses of operating a medical school and hospital cannot be altered in direct proportion to such conditions. Likewise, the revenue from outside teaching grants varies with economic conditions and with foundation and governmental policies, and again costs cannot be adjusted rapidly enough to stabilize the cost of instruction. It also is obvious that tuition fees cannot be altered to meet these changes.

5. HOURLY TRAINING COST PER UNDERGRADUATE STUDENT

The hourly teaching cost per undergraduate medical student, as shown in table 3 for another endowed school, and in the estimate for Duke, involved so many variables that, in spite of many attempts and revisions, the Duke figures are too vague to be useful. Salaries for Duke instructors in the 1946-1947 budget totaled $393,994. Budgets for departments (including salaries) totaled $838,955. Each student had 5,148 hours of instruction. There were 290 students in 1946-1947. Therefore, $393,944 divided by 5,148 hours equals $76.52 (cost of teaching per hour of curriculum), and $76.52 divided by 290 undergraduate students equals 26 cents (cost of teaching per hour per undergraduate medical student). These figures would be doubled if calculated on the total departmental budgets instead of on the salaries alone. The figures for each of the two schools are so different that it is unlikely that the basis for the calculations were comparable. For example, the number of hours in the two curriculums are 10% apart (4,570 vs. 5,148). These discrepancies are further proof of the futility of attempting to correlate the budgets of two or more schools without a uniform accounting system.

6. TEACHING LOAD AND HOURLY TEACHING COST

The attempt to calculate the teaching load and the hourly teaching cost per instructor and per department was another noble experiment and as hopeless as the one to which President Hoover referred. In addition to all the accounting problems previously mentioned, no accurate division can be made of the duties of a medical faculty: (*a*) the instruction of medical, nursing and technical students, interns, and residents, (*b*) research, and (*c*) the professional care of patients, even if each instructor punched a time clock every time he changed his activity. Nor can an accurate figure on the cost of instruction be obtained by listing the scheduled "contact" hours of each instructor with undergraduate medical students (excluding the more variable time spent with the house staff, patients, nurses, and technicians, and on research) and dividing these figures into the budgets of each department. Furthermore, each department, in addition to its medical school duties, provides considerable service to the hospital. For example, all the routine blood chemistry studies are performed by the biochemistry department and the blood and other cultures by the bacteriology department; all the surgical and other pathological studies are made by the pathology department; and much of the basic training for the hospital residency program is furnished by the faculties of the anatomy, physiology, pharmacology, and other such departments. It is practically impossible to estimate and apportion the time and money of these departments devoted to hospital and medical school activities. A summary of these attempts to calculate the hourly costs for the 1946-1947 budget is given in table 4, but its value is questionable, and that is an understatement.

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[17] Collections include only direct payments by patients and by agencies for charity patients. They do not include Duke endowment payments, outpatient income, staff room and board receipts, or any other miscellaneous items.

TABLE 4.—*Teaching Load[*] and Costs, Duke University School of Medicine, 1946-1947 Budget*

Item	Mean	Minimum and Maximum[†]
Weekly teaching load per instructor[‡]	8 hr.[§]	4-14 hr.[§]
Weekly research, hospital, and other activities per instructor	10 hr.	8-28 hr.
Hourly teaching cost per instructor (teaching salaries only)	$118.62	$45.55-201.70
Hourly teaching cost per instructor (including other expenses of the department)	179.55[‖]	104.90-596.03[‖]
Hourly teaching cost per department (teaching salaries only)	17.59	8.39-47.67
Hourly teaching cost per department (including other expenses of the department)	28.51[‖]	16.21-140.88[‖]

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[*] Exclusive of the instruction of nurses, technicians, and graduate students (house staff and fellows). *Instruction in medical schools is based* on a 39-hour week, and not the usual 15-hour college week.

[†] It does not follow necessarily that the lower figure indicates that the individual instructor's teaching load is too heavy or that his salary is too low. Neither does the higher figure imply that the instructor spends most of his time in research or in the care of patients.

[‡] The teaching load and costs are based on those of the full-time instructors, including geographic full-time instructors.

[§] Teaching hours per week per instructor based on 33 weeks of 39 hours each.

[‖] These figures would be more than doubled if they included the expenses of medical school (not university) administration, $30,400; medical library, $13,608; medical art, $15,507; experimental animals, $16,650; and maintenance, $62,500. Approximately $300,000 in research expenses paid by outside funds is not included.

SUMMARY

1. An attempt has been made to analyze the cost of medical instruction at the school of medicine and hospital of Duke University, an endowed institution.

2. The costs of medical instruction at any school are largely determined by (1) the accounting system—a uniform procedure for medical schools and hospitals is greatly needed, (2) the aims of the school, i. e., utilitarian, as in a high school, or engaging in research as in a university, (3) the proportion of strictly and geographically full-time and part-time faculty members, and (4) the varying subsidy required by the teaching hospital. The hourly teaching cost per student and the teaching load and the hourly teaching cost per instructor and per department are too variable by present methods of analysis to be determining factors in the picture.

3. On the basis of the outmoded and misleading yardstick of medical education calculated by charging the total university subsidy solely to the undergraduate medical students, the annual net total cost of medical instruction, including tuition, has varied from $305,368 in1933-1934 to $891,356 in 1946-1947, and the annual cost per undergraduate medical student has ranged from $1,582 to $3,626 (exclusive of the higher costs in 1930, when the school was opened). The causes of these fluctuations are discussed.

4. In order that the medical students and the public may appreciate the financial problems of medical education as well as be informed of the services other than medical education that are erroneously charged solely to undergraduate medical students, the annual net total cost of the Duke University School of Medicine and Hospital has been honestly, realistically, logically, and fairly accurately distributed among such items as research, professional care of ward and outpatients, hospital expense, intern and resident training, and nursing and technician instruction. If the members of the community at large who benefit from these additional services reimbursed the university for them, the average annual net cost of educating an undergraduate medical student would be less than $1,000, which is comparable with that of other students in a university and, considering his relative value to the public, probably a worthy investment of university funds. This figure would be even smaller if reimbursement for the professional care of indigent patients were deducted from the budget.

5. The amount spent on medical education, by any standard of comparison, is modest considering the nature, thoroughness, and length of training. Furthermore, it must be remembered that medical, nursing, and technical students receive instruction on the basis of a 39-hour week instead of the 15-hour week that is the usual university load.

6. In spite of the low distributed cost of medical education, all medical schools greatly need additional financial support to maintain and improve their present standards and to increase their enrollment, so that the public may receive more and better medical care.

Employment of the Aged.—One of the basic needs of all people, young or old, is to retain position and dignity in a society that places value on contributory status and self-sufficiency. This means that older people must have a continuing opportunity to work and that compulsory retirement based on arbitrary chronological ages must be abandoned. How to achieve this is now occupying the attention of many employers and labor groups, as well as professional workers.

Society too has a great stake in the employment of older people as the period of life lengthens after the traditional retirement age. We are, indeed, approaching the time, unless we take steps to prevent it, in which the total years of dependency in childhood, youth and the older years will equal the period of gainful employment. It is generally agreed that this situation, if allowed to continue unchecked, threatens the level of living of the entire population. The solution seems to lie in recognizing the extended period of vigor in enabling more older workers to continue in paid, productive employment.—Clark Tibbitts, B.S., Aging: Implications for Public Health, *Public Health Reports*, February, 1952.

CARE OF SEVERELY PARALYZED UPPER EXTREMITIES

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Physicians who care for patients handicapped by the after-effects of acute anterior poliomyelitis are becoming increasingly concerned over the problem of care for severely involved upper extremities. This interest has grown out of an increasing demand for care of this type, which is due not only to the high incidence of poliomyelitis during the past few years but also, in a great part, to improved methods of saving life during the acute stage of the disease. It is reasonable to believe that in the past these patients usually did not survive the acute stage. The purpose of this paper is to outline methods of care of the patient with severe flaccid paralysis of the upper extremities and to discuss ways of increasing functional capacity through the use of adaptive apparatus. No attempt will be made to discuss the countless details of apparatus design or the training techniques necessary to give the patient the best use of such apparatus.

In the 18 months prior to April, 1951, 324 patients with permanent severe weakness of the upper extremities were treated at Georgia Warm Springs Foundation. On gross analysis, it was found they could be classified into three groups, according to the severity and extent of involvement: 20 had functionally flail shoulders, arms, forearms, and hands bilaterally; 84 had somewhat less extensive involvement, although in all of these the strength of the forearm and hand and of either or both the shoulder and arm was below functional level; 219 had a functional level of strength in the forearm and hand but below this level in either the arm or shoulder or both. For practical purposes, the extent of involvement can be determined by evaluating the strength of the deltoid as the prime mover in the shoulder, of the biceps and the brachioradialis in the arm, and of the finger and thumb flexors in the forearm and hand.

STAGE OF POSSIBLE NEUROMUSCULAR RECOVERY

As for all involved bodily segments, treatment for the upper extremities during the early convalescent stage is based on the assumption that the patient will eventually recover normal use of the weakened or paralyzed muscles. Therefore, treatment consists of protection and support, gradually increased mobilization, and muscle stimulation and reeducation in all involved segments.

Protection and Support.—During the period of complete bed rest the shoulder and arm are supported by pillows and sandbags. No specific "neutral" or "natural" position is demanded; rather, the shoulders are rested in several positions of abduction and rotation during the day and night. These positions are dictated primarily by the patient's comfort. Similarly, the arm is supported in varying degrees of flexion and extension. No one position is maintained for more than two or three hours at a time. All painful positions and those requiring complete extension of a muscle should be avoided. The wrist and hand may be supported temporarily by small pillows, sandbags, and rolls of cotton batting, but more permanent splinting must be ordered immediately and applied as soon as it is ready. A simple metal thumb and wrist support is routinely used for this purpose in our institution (fig. 1). If there is severe weakness in the finger extensors a so-called platform attachment can be made to slip under the fingers and fasten onto the hand splint. This can be removed easily so that no persistent strain is put on the finger flexors. It may be curved to keep the fingers in a more normal position of slight flexion.

If the forearm and hand remain completely flail the hand splint is used to hold the wrist, fingers, and thumb in normal alignment, and it later serves as a base for the attachment of certain adaptive apparatus, which will be discussed in another section. Often there is recovery of enough strength to flex the fingers but not enough to extend them. This pattern of recovery occurs so frequently in the otherwise severely involved patient that it seems wise to mention it at this point. Even with this power to flex the fingers the hand has little functional value, because the fingers cannot be drawn away from the palm to permit grasping or pinching, or they cannot be extended for pressing, as in typing. The use of an extension assistive attachment on a splint enables very light rubber bands to substitute for the extensor muscles. It may then be possible for the patient to use his hand in a fairly normal manner, and his functional capacity is greatly increased. The bar to which the rubber bands are attached must be placed very carefully in order to abduct the fingers as well as extend them. Aluminum rings fitted snugly to the middle phalanx are more satisfactory than leather cuffs. The flexor power in the fingers may be so small that the fingers cannot be closed against the resistance of the ordinary rubber bands, even when cut to a single strand; in this case, very thin strips of dental dam rubber will often be strong enough to lift the fingers into functional extension but still permit flexion to occur.

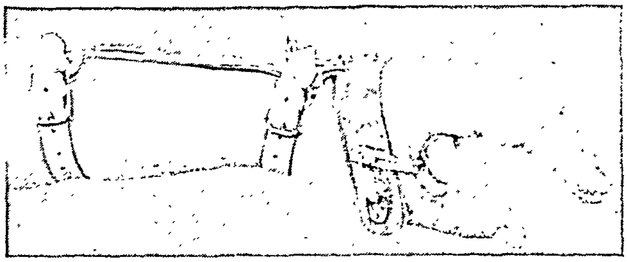

Fig. 1.—Basic splint used for support of wrist and hand; it is commonly called an opponens splint with wrist attachment.

From Georgia Warm Springs Foundation.
Read before the Section on Physical Medicine and Rehabilitation at the One-Hundredth Annual Session of the American Medical Association, Atlantic City, June 15, 1951.

When the patient is permitted to assume a semisitting position in bed, the forearms and hands should be rested on a bed table. This protects the shoulders and arms. The hands are supported by the splints mentioned previously. The table should be sufficiently high to support the arms in a position of 70 to 80 degrees forward flexion and abduction. When the patient is able to sit in a wheel chair, the same type of support and protection is maintained by a high lapboard attached to the arms or back of the chair. (fig. 2). If considerable tightness exists in the shoulders so that 70 or 80 degrees of flexion-abduction is not possible without abnormal scapular elevation and rotation, then a lesser angle is permitted until mobilization is accomplished.

Mobilization.—Exercises designed to maintain or regain functional ranges of motion in these segments should be started immediately. Initially they consist merely of changing the patient's position every few hours. If there is limitation of movement, gently passive motion is provided several times each day, with increasing stretching force applied, but there must be no hurry to release existing tightness. Too vigorous stretching not only will tend to cause persistent pain but will actually result in increasing the tightness. The use of moist heat is an aid to mobilization, but it must be accompanied or followed by motion to be of any real value. A common fault is to begin the stretching both too late and too vigorously.

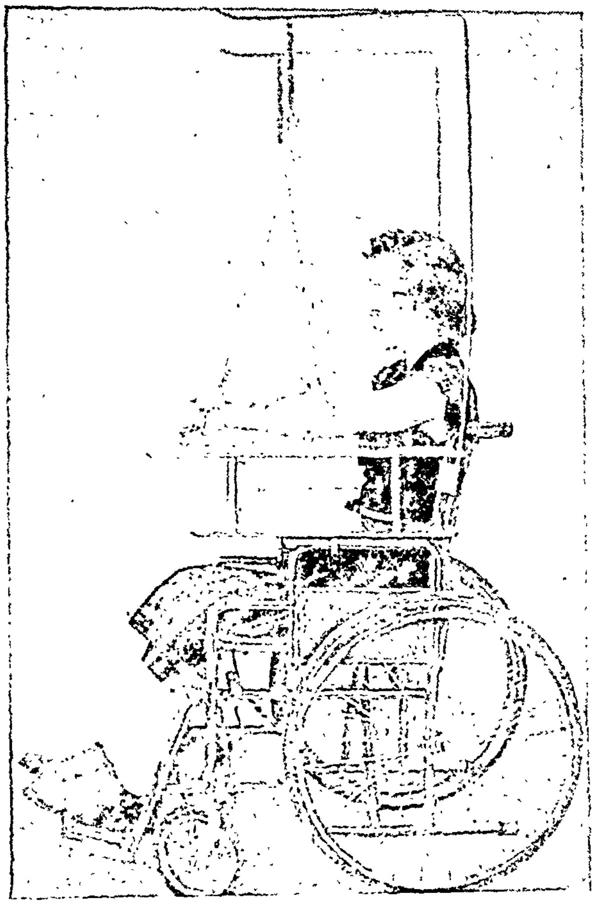
Fig. 2.—Lapboard and overhead sling attachments for wheel chair.

Muscle Stimulation and Reeducation.—Several ways to facilitate the recovery of voluntary control of motor units have been developed through experience with and knowledge of the physiology of the neuromuscular system. First, the bodily segments controlled by the involved muscles must be put into a position in which movement can be initiated and carried out with the least effort. Ideally, the movement should closely approximate normal functional patterns. A second method is to excite flexion and extension reflexes by passive movements. These movements may consist of high frequency, almost vibratory motion through a short range or may be a slower alternate shortening and lengthening of the muscle through a wider range. Mass movements or combinations of movements may also be used to excite initial voluntary use of recovering motor units. These movements should be within the range of normal usage. Electric stimulation of the involved muscles may be used as a means to focus the patient's attention on the muscle under treatment and thus facilitate the return of voluntary control; however, this is a tedious and usually painful procedure and, in our experience, has seldom shown any advantage over assistive splinting and passive motion.

The apparatus most commonly used to assist and encourage voluntary motion in the shoulder and arm are the overhead sling and the lapboard (fig. 2). The overhead sling brings the shoulder into a position of function: It consists of two leather cuffs attached to an ordinary screen door spring, which in turn is attached to a rigid support. The most practical support is a metal rod approximately ⅜ in. in diameter and about 5 ft. long. One end of this rod is attached to the outer surface of the lateral upright of the back of a straight chair on the side of the involved upper extremity. Bilateral slings can be used if both shoulders are involved. The rod is bent to a right angle approximately 22 inches from the upper end. The loop at the end of the spring is slipped over this horizontal end of the upright support so that the spring and attached cuffs hang downward. With the patient seated in the chair, the supports should be adjusted so that the arm is held away from the body in a position of flexion and abduction at an angle of approximately 70 to 80 degrees. The cuffs fit under the elbow and the distal third of the forearm. The cuff at the elbow has a circular hole in the center that anchors it at this point, and soft leather or felt loosely stitched across this opening adds comfort. If the patient is wearing a hand splint, a small ring can be attached to it, and the cuff that ordinarily supports the forearm can be replaced by a clip that is easily hooked onto the ring. The ring can be placed so that the pull of the overhead sling holds the arm in a desired position of supination or pronation.

When the upper extremity has been properly positioned by the sling, the patient should have use of a table, or should have a lapboard attached to his wheel chair, of such height that the elbow clears the top of the table by one-half to one inch. The forearm cuff should be adjusted so that the forearm slopes downward and the hand is at the table in the functional position. As mentioned previously, the purpose of this sling is to bring the shoulder into a position of function. The spring and leather strap attached to the cuffs allow at least 100 degrees of horizontal motion. The spring permits vertical motion of the arm by directly augmenting any power in the deltoid muscle groups and assisting all muscle groups that take part in forward flexion and abduction. Also, the change of tension in the spring stimulates flexion and extension reflexes in the muscle groups about the shoulder, particularly in the deltoid muscles, and thus acts as a means of facilitation. If strength returns to the segments of the upper extremity, graduated progressive types of muscle reeducation should be instituted. These are well known and will not be discussed here.

STAGE OF ADAPTATION TO RESIDUAL HANDICAP

If, after a period of four to six months of adequate treatment, the shoulder, arm, forearm, and hand show no muscle strength above a "trace" to a "poor minus" level it may be assumed that further muscle reeducation, carried out over an indefinite period of time, will not bring back significant functional strength. The problem then is to make the most use of whatever muscle power has been restored to develop some degree of functional independence. To accomplish this it is necessary to provide mechanical apparatus that will permit the patient to move his hand over the surface of the desk or table and to bring his hand to his head. If it is possible for the patient to effectively manipulate such apparatus, the next step is to provide holders to be attached to his hand or hand splint for certain normally used objects, such as a spoon, toothbrush, pencil, lipstick, cigarette holder, glass, electric razor, and telephone receiver. These items can be positioned within the range of the patient's head so that they can be used with some degree of adequacy and independence.

The basic apparatus for assisting the patient in moving his hand about a horizontal surface is the overhead sling already described. This sling usually must be modified by the addition of a so-called suspension feeder to permit the patient to bring his hand toward his mouth (fig. 3). This feeder consists of a cradle for the forearm attached to the sling by a swivel joint to permit flexion and extension of the elbow and horizontal circular movements of the forearm. As the patient shifts his body toward the side with the feeder, the elbow is depressed and the hand raised and brought inward. The opposite motion raises the elbow and lowers the hand. This method is used by patients in whom no shoulder elevation or depression is possible. If the patient has voluntary control of shoulder depression a greater degree of precision is possible in positioning the hand and bringing it to a desired level. Even with severely limited strength in these muscle groups some control can be obtained by thrusting the head forward and from side to side. Fortunately, many of these patients have some residual strength in the upper trapezius, and the elevation and depression of the shoulder by contraction and relaxation of this group of muscles is a great help in using the feeder. The feeder can be used not only for feeding but also for such activities as moving a pencil, turning the pages of a book, typing, and using a toothbrush. If, in addition to some voluntary movement in the shoulder girdle and stability in the trunk, the patient also has some power to supinate the hand and flex the fingers many more activities become possible. One immediate advantage is the ability to use a feeder mounted on a stand instead of suspended from the overhead bar (fig. 4). This feeder is not only more portable and less conspicuous but can be moved about the table as necessary, allowing far greater precision of movement. It may also be possible for the patient to use a small portable feeder that can be easily clamped to any table. This has the obvious advantage that it can be carried in a pocket or purse, but it has the disadvantage of being clamped in a single position on the table.

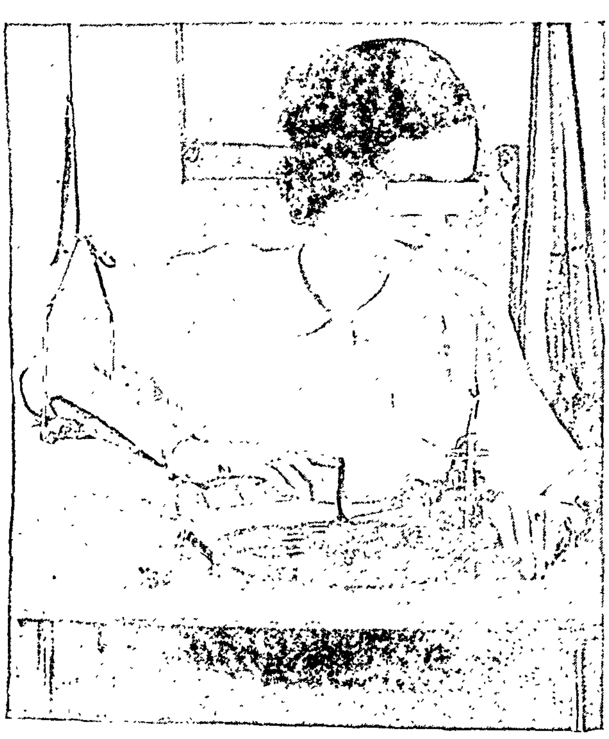

Fig. 3.—Suspension feeder (left) attached to the overhead sling for support of the forearm and glass holder (right) with attached glass straw.

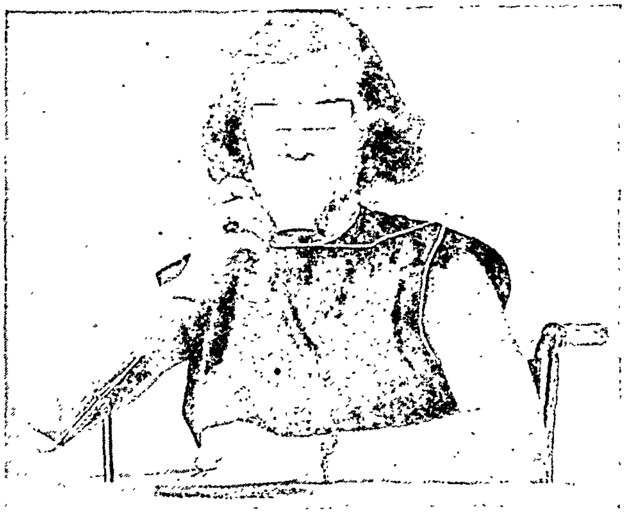

Fig. 4.—Feeder mounted on a stand.

After it is found that the patient can be taught to move his arms in the feeder about the table or lapboard and to bring his hand toward his mouth, apparatus must be provided to permit him to carry out the activities of eating, hygiene, writing, and telephoning. Effective manipulation of the feeder is usually the deciding factor in determining the practicality of such apparatus for these patients.

Feeding.—If the patient's hand is completely flail the spoon or fork must be attached to the hand by rings or clips or to the hand splint or feeder cradle by means of a "T-bar." A rectangular sleeve fastened to the fork or spoon permits easy attachment to and removal from this T-bar. The shape and length of the spoon or fork must be modified to suit the individual patient. Because the patient lacks the ability to supinate and pronate his hand, a swivel fork or spoon must often be provided so that the spoon bowl or fork prongs always hang horizontally and the patient can bring the food to his mouth without spilling it (fig. 5). The degree of swing of the swivel end is controlled by stops that stabilize the spoon or fork when the patient is scooping up food. Patients with such severe involvement will never be able to lift a glass or cup to the mouth, and holders must be made for positioning these within the range of the patient's head movements. Glass tubes or straws can then be used for drawing the fluid into the mouth (fig. 3). The correct type of dish may be as important a factor in successful feeding as the feeder itself. A dish with ¾ in. to 1 in. high sides may be necessary, at first, as a help in pushing the food onto the fork or spoon. If the patient's involvement is severe he may be able to move the feeder in only one plane or groove, and only a small area of the plate can be used. In this case some arrangement must be made for turning the plate as necessary. A Lazy-Susan type of apparatus can be made to hold the plate and can be turned by one of several methods, including a ratchet and spring activated by swinging the feeder or by abduction and adduction movements of the knee if there is strength in the hip and thigh.

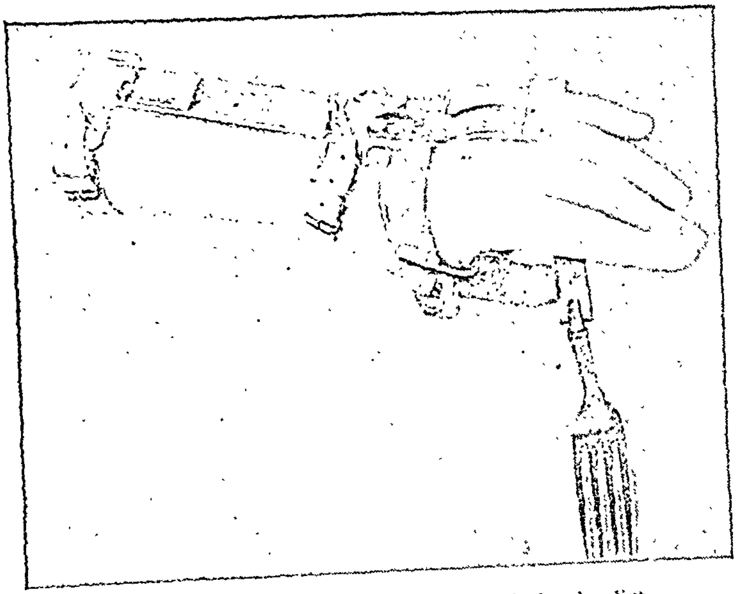

Fig. 5.—Swivel fork attached to the basic hand splint.

Hygiene.—The possibilities of obtaining independence in personal hygiene are limited for these patients, but they can be taught to scrub their teeth and often to shave with an electric razor or to apply make-up. Often, a man can be taught to comb his hair. The toothbrush, lipstick, or comb may be attached to the hand splint or feeder cradle in the same manner as the spoon or fork is attached. The electric razor must be attached to the top of a stand that brings the razor to face level; by moving the head from side to side, all portions of the beard can be reached. A desk lamp with a heavy metal base and a gooseneck shaft makes an ideal stand on which to attach the razor.

Writing and Typing.—For the severely involved patient, writing is not only possible but becomes practical if he is willing to practice in order to develop speed and legibility. The pencil or pen is fastened to the hand splint or feeder, and movements of the trunk, shoulder, and head are used to achieve a modified Palmer method of writing. Typing is much more easily accomplished; contact with the keys is made with a wooden or plastic rod. One kind of typing stick has a rubber or plastic mouth piece that is held between the teeth, and the keys are struck by means of head movements. A slip-on rubber eraser or the rubber bulb of a medicine dropper is attached to the contact end. Typing can also be done with sticks attached to the hand splints or feeder cradles. This is somewhat more difficult for the severely involved patients, but it has the advantage of bilateral use of the sticks. Electronic typewriters must be used because of the minimal pressure needed to activate the keys and the automatic carriage movement.

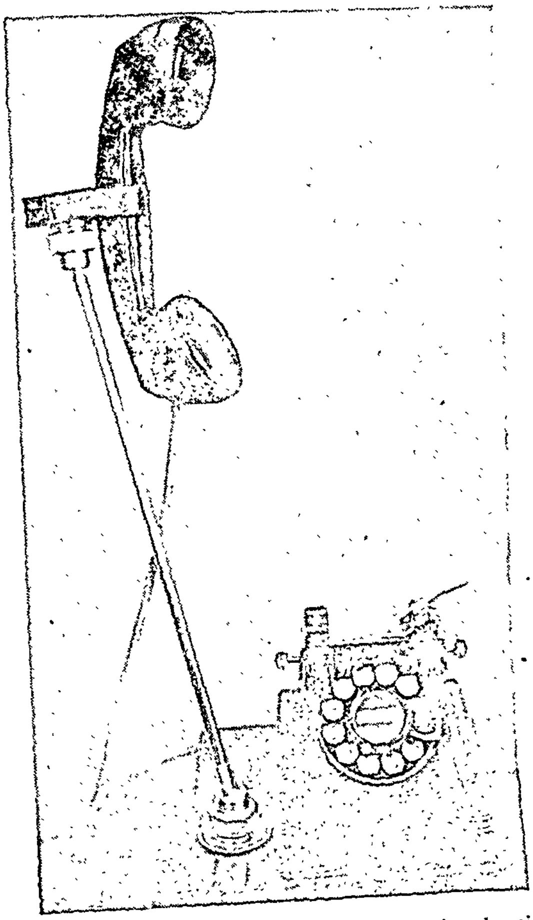

Fig. 6.—Holder for telephone receiver; note the hinged weight on the base used to open and close the circuit.

Telephoning.—Ability to use the telephone adequately is an important part of the patient's rehabilitation. Obviously, the mouth piece and receiver must be mounted on a support within the range of the patient's head movement (fig. 6). Such phone holders are available commercially or can be made similar to the mount suggested for the electric razor. It is also necessary to provide a means of opening and closing the circuit. This can be done by hinging a small weight over one of the buttons of the usual city phone or over the receiver hook of the older model. This weight can be moved on or off the circuit breaker by striking it with the feeder held hand. If dialing is necessary, a wooden or plastic rod can be made similar to the typing stick; a type that is held between the teeth is the most practical for these patients.

REPORT OF A CASE

A 25-year-old woman was admitted to the Georgia Warm Springs Foundation for functional training in March, 1950. She had contracted acute anterior poliomyelitis at the age of 15, with severe involvement throughout the back, abdomen, and all four extremities. Over a four year period, from October, 1940, through November, 1944, she was hospitalized for care on four different occasions, for a total of 25 months. Muscle examination at the time of admission revealed that the level of strength of all skeletal muscles ranged from "zero" to "poor minus," except for the posterior neck groups, which rated "good minus," and the intrinsic muscles of the fingers of the left hand, which ranged as high as "fair plus," although there were no intrinsic muscles functioning in the left thumb.

In a functional test given on admission, it was found that the patient had learned to type and to dial a telephone, both with a stick held in her mouth. No other functional activity had been achieved. Because of her severe involvement, it had been necessary for her father to place her in a large wooden chair early in the morning before he left for work. She had to remain in this chair in an erect or semireclining position until her father came home in the evening, because her mother could not lift her; if she didn't feel capable of staying up all day she had to remain in bed until her father came home in the evening.

At the foundation the patient was fitted with bilateral cock-up splints with T-bar attachments to support her fingers and to hold functional apparatus; bilateral suspension feeders; a double lapboard; a holder for her toothbrush, lipstick, pen, and pencil; a plastic mouth piece for a mouth typing stick; a holder on the right feeder for the mouth typing stick; and bilateral plastic dialing rods for typing. In addition, a telephone holder was attached to her portable wheel chair. At the time of her dismissal, June 17, 1950, after a three month training period, her functional test showed that she could eat two meals a day using a spoon and fork and could drink independently from special apparatus. She could brush her teeth, put on her own lipstick, write letters with a pen or pencil, type with typing sticks attached to her hand splints, and use a telephone. She was fitted with a special portable chair, and her mother and father were both taught how to get her into and out of bed in one and one-half minutes. Thus, in a period of 3 months, this young woman who had been completely helpless for 10 years was taught to perform independently many useful activities.

CONCLUSION

The purpose of this discussion is to stimulate interest in the care of the patient with severely paralyzed upper extremities. Unfortunately, many physicians tend to think of recovery in terms of the patient regaining the ability to walk. Over the years, effective apparatus and training techniques have been developed to help patients with severely involved lower extremities, but little has been done for the patient with paralyzed upper extremities. The restoration of some degree of independence to these latter patients is actually far more dramatic and gratifying. As more awareness of and interest in this problem develops, great strides should be made in the development of functional apparatus and training techniques. It must be remembered that this discussion emphasized only the care of patients with the most severely involved upper extremities. When recovery of even a small amount of strength occurs in any part of an upper extremity, the possibilities of increased functional capacity through the use of special apparatus and training are greatly extended.

TESTICULAR TUMORS

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Although the prognosis of tumor of the testis is better than that of other tumors of the genitourinary tract (with the exception of carcinoma of the penis), the fact that they occur in the prime of life produces a grim picture indeed. Following World War II several large series of cases were reported, the outstanding of which was the series of 922 reported by Friedman and Moore[1] from the Army Institute of Pathology. Since the majority of servicemen are in the age bracket in which most testicular tumors occur, a large number of cases were collected between 1940 and 1946. It was found that the incidence of testicular tumors in servicemen in World War II was 1 in 10,000 troops. Testicular tumors account for 3% of the malignant lesions of the genitourinary tract in the male and between 1 and 2% of all malignant tumors.

Age.—In general, testicular tumors occur most frequently during the active sexual life of the patient. They have been reported in patients from 6 months to 78 years old, but they occur most frequently in men from 18 to 40 years old. Teratoma occurs earlier in life than seminoma. The average age of patients with teratoma is in the late 20's, while for seminoma it is in the early or middle 30's.

Location.—Tumors of the testis are found slightly oftener on the right than on the left side in the proportion of about 53: 47. Gill and Howell[2] reported on 156 cases of bilateral testicular tumors. In about 50% of these cases the second malignant lesion occurred anywhere from a few weeks to 13 years later than the first. Many of the second tumors also occurred in ectopic testes.

Histogenesis.—The tissue of origin of testicular tumors is totipotential and capable of developing along lines similar to those found in the earliest phases of differentiation in the fertilized ovum. The first type of differentiation is the trophoblastic differentiation, represented in the testicular tumors by chorioepithelioma. The second type of differentiation is concerned with embryogenesis, and consists of elaboration of the three germ layers. This is represented among testicular tumors by embryonal carcinoma, teratocarcinoma, and adult teratoma. The third line of development is concerned with the formation of reproductive tissue and is represented among testicular tumors by seminoma. New growths of the male gonad differ in that they do not reproduce testicular tissue but express the latent unlimited potentialities of the embryonic germ cells from which they arise.

Pathology.—Friedman and Moore and others have found that 96% of testicular tumors can be classified as

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[1] Friedman, N. B., and Moore, R. A.: Tumors of Testis: Report on 922 Cases, Mil. Surgeon 99: 573-593 (Nov.) 1946.

[2] Gill, R. D., and Howell, R. B.: Primary Bilateral Testicular Tumor, J. Urol. 59: 940-947 (May) 1948.

Examination revealed slight tenderness over the right renal region. No palpable masses were noted in the abdomen. The left testicle was normal in size, shape, and consistency. The right testicle could not be palpated distinctly. There was a nodular, firm, tender mass measuring 8 by 6 cm. It did not transilluminate. The scrotal skin was not adherent to the mass. Rectal examination revealed no abnormalities. Results of urinalysis and complete blood count were normal. There were no tubercle bacilli in the 24 hour urine concentrate. Results of a tuberculin test and a chest roentgenogram were negative. The intravenous pyelogram revealed normal renal excretion and concentration, with no obstruction. There were no extrinsic shadows seen. Psoas shadows were normal. There was no displacement of the ureters or bladder.

On March 26, 1949, with the patient under spinal anesthesia, an inguinal exposure of the cord was carried out. The cord was clamped with rubber-covered intestinal clamps, and the testicle examined. A hard nodule was located at the junction of the testicle and epididymis, with two smaller nodules lying in the lower portion of the testicle. The cord was ligated high in the inguinal canal, and the cord and testis removed. The immediate postoperative course was uneventful. The pathological findings revealed embryonal carcinoma. The patient received x-ray therapy. Five months after the orchiectomy a chest roentgenogram revealed an obvious gross metastatic pulmonary lesion. The patient died six months later.

Comment.—In this case a testicular tumor could have been suspected and exploration performed when the patient first sought medical attention. Sudden onset of pain and swelling of the testicle are not infrequent with testicular tumor, and usually signify hemorrhage into the tumor. In 6 of Auerbach's [12] series of 26 cases of testicular tumors, pain was the presenting symptom. Testicular neoplasm should be suspected in all cases of apparent epididymitis. A history of a mass, swelling, or increased weight of the testis prior to the pain can frequently be obtained, as in this case, on careful questioning.

Case 2.—This 41-year-old white man was first seen Oct. 5, 1948, with a small nodule at the base of the left testicle. The patient stated that he had not noticed change in the size or consistency of the mass for a period of two years. There was no pain. He denied backache, loss of weight, and venereal disease. The physical examination revealed no abnormality but a round, firm, 1.5 cm. sized mass at the base of the left testicle. It was separate from both the testicle and epididymis. It was not adherent to the skin. It was not tender. The laboratory findings were negative. A chest roentgenogram showed no abnormalities.

Exploration of the left scrotal contents revealed a small, round, rubbery, 1.5 cm. sized grey nodule lying between the testicle and the epididymis, entirely separate from both, with a capsule of its own. The tumor was shelled out without difficulty, with no evidence of adherence or invasion, and therefore was not considered malignant. The pathological findings revealed teratoma with adenocarcinoma. A high ligation of the cord was then carried out, and the cord, epididymis, and testicle were removed. A careful pathological search failed to reveal evidence of tumor tissue in the testis or epididymis. X-ray therapy was not considered advisable in view of the absence of tumor within the testicle and the radioresistance of this type of tumor. The patient is alive and well with no evidence of metastasis three years after orchiectomy.

Comment.—This type of lesion could easily have been considered epididymal induration or a benign cyst of the epididymis. Testicular neoplasms outside of the parenchyma of the testicle are rare. In reviewing the literature I have found no case of this kind reported. It is well known, however, that testis tumors can arise from any part of the abdomen occupied in embryonal life by the anlage of the testes, but such tumors rarely descend with the testis. In this case the tumor must have originated in this manner and been so intimately adherent to the testis that it descended with it.

Case 3.—This 48-year-old white man complained of decrease in size of the right testicle of three years' duration. He denied mumps, injury, and venereal disease. The patient had never had tuberculosis or any other serious illnesses. Chest roentgenograms revealed no abnormalities. He was married and had three children. There had been no weight loss. He complained of an ache in the groin, but denied testicular pain. He had mild back pain but no urinary symptoms.

Results of the physical examination were entirely normal except in regard to the genitalia. The left testicle was normal in size and consistency. The right testicle was small and soft. There was a small nodule at the lower portion of the testicle, which appeared to be within the parenchyma of the testicle. It was not tender. An exploration revealed a pea-sized tumor at the lower pole of the right testicle. A high ligation of the cord was performed. The pathological report revealed seminoma, and the patient received x-ray treatment.

Comment.—This is an example of actual decrease in size of the testicle with a tumor present and without previous hemorrhage into the tumor. It emphasizes the importance of early removal of a testis with any suspicious nodule or induration.

Case 4.—This 21-year-old unmarried white male had a sudden onset of pain and swelling of the right testicle Oct. 3, 1949. He denied injury, urinary infection, or exposure to venereal disease. When first seen two and one-half weeks after the onset of symptoms, the testicle was large and tender. Temperature was normal, and the white count was normal. The patient had lost 8 lb. (3.6 kg.) in two and a half weeks. He denied previous testicular heaviness or tenderness.

The left testicle was normal in size, shape, and consistency. The right testicle was two times the size of the left, extremely tender and hard. An intravenous pyelogram revealed no abnormalities. Three 24 hour urine specimens contained no tubercle bacilli. Following bed rest, testicular support, and sulfonamide therapy for four days the pain subsided, but the tenderness remained. The cause of the testicular swelling at this time was questionable. It did not have the appearance of either epididymitis or testicular tumor. There was no evidence of torsion or hydrocele. During the ensuing six weeks the mass decreased considerably in size, and the tenderness subsided. Ten weeks after onset the right testis was round, hard, smooth, and symmetrical. It did not transilluminate. Tumor was considered likely since the mass was quite hard. The scrotal skin was adherent to the base of the mass. A chest roentgenogram showed no abnormalities.

Exploration was carried out through an inguinal incision. The mass was firmly adherent to the scrotum and was dissected off with difficulty. The tunica albuginea was markedly thickened. There was no evidence of torsion of the cord. The testicular tissue was dark and hemorrhagic, and there was a large, hemorrhagic mass lying between the testicle and epididymis. Although a tumor was not seen or palpated, it could not be excluded. Since the testicle and epididymis were destroyed, removal was the logical course. The pathological examination revealed hemorrhagic infarction of the testicle and epididymis with complete destruction.

Comment.—Barrington [13] in 1914 reported on 15 cases of hemorrhagic infarction. The pathological findings indicate that interstitial hemorrhage occurs into a previously healthy testis. Aseptic necrosis of the parenchyma follows presumably from increased pressure inside the rigid tunica albuginea. The subsequent shrinking is due to the gradual replacement of the necrosed parenchyma by fibrous tissue. The cause of hemorrhagic infarction remains unexplained.

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[12] Auerbach, O.; Brines, O. A., and Yaguda, A.: Neoplasms of Testis, J. Urol. 56: 368-374 (Sept.) 1946.

[13] Barrington, F. G. F.: Case of Suppurative Colinephritis, Brit. J. Surg. 2: 260-262, 1914.

Although in this case the enlargement proved to be due to hemorrhagic infarction rather than tumor, there is no diagnostic means of distinguishing one from the other. I have encountered two subsequent cases of hemorrhagic infarction both of which were suspected but could not be proven prior to operation.

Case 5.—A 26-year-old white man was first seen Nov. 11, 1949, at which time he had noticed a lump in the right testicle, which had been increasing in size for several months. He had noted the testicular swelling in April, 1949, at which time he was hospitalized for a back injury. However, he thinks (but is not certain) that he had a swelling of that testicle when he was discharged from the Army in 1946. He did not notice heaviness of the testicle at any time, and there was no back pain or loss of weight. He had been in excellent health and was planning marriage.

Physical examination was negative except for the genitalia. The left testis was normal. There was a hard mass firmly adherent to the anterior surface of the right testicle. The mass was separate from the epididymis and appeared to be within the parenchyma of the testicle. Results of urinalysis were negative. An intravenous pyelogram and chest roentgenogram revealed no abnormalities. The preoperative diagnosis was testicular neoplasm. A right orchiectomy and high ligation of the cord was performed. The pathological findings revealed a benign epidermoid, or inclusion, cyst. This is the third reported case of this type. The patient is alive and well two years postoperatively.

Comment.—Benign testicular tumors are extremely rare. Dockerty and Priestley [14] reported the first case of a pure epidermoid cyst encased within an otherwise normal testis. Gage and Brodie [15] reported the second case.

The observation that all teratomas of the testis should be regarded as malignant until proven otherwise applies also to the inclusion cysts, or dermoids. Very few of the benign testicular tumors are unidermal, as in this case. Almost all are bidermal or tridermal teratomas containing merely an excess of ectodermal structures. Carey emphasized the malignant potentialities of even the seemingly benign tumors of this type. He pointed out that some of the most fully differentiated neoplasms metastasized locally or distally, and concluded that it was dangerous to make a histological diagnosis of benign testicular tumor.

SUMMARY

The clinical aspects of testicular tumors are reviewed. Errors in diagnosis are frequent and emphasize the importance of early orchiectomy in the presence of any suspicious testicular lesion. Cases are reported illustrating difficulties in early diagnosis. A case of benign unidermal testicular tumor is discussed. This is the third such tumor to be reported. Improvement in the mortality rates depends chiefly on early orchiectomy.

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14. Dockerty, M. B., and Priestley, J. T.: Dermoid Cysts of Testis, J. Urol. **48**: 392-400 (Oct.) 1942.

15. Gage, A. A., and Brodie, E. L.: Epidermoid Cyst of Testis, J. Urol. **63**: 539-541 (March) 1950.

NITRITE AND THIOSULFATE THERAPY IN CYANIDE POISONING

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In 1932 Geiger [1] began to use methylene blue in treatment of cyanide poisoning. The antidotal action of the dye was shown by Wendel [2] and Hug [3] to be due to the formation of methemoglobin, which successfully competes with the respiratory enzyme, ferricytochrome oxidase, for cyanide ions. Subsequent reports [4] indicate that methylene blue is not an efficient antidote because it is a poor methemoglobin former and at the same time reverses the reaction in presence of co-enzyme.[5] In fact, the dye is of greater value in the treatment of methemoglobinemia [6] than in cyanide poisoning. Nevertheless, the trial of methylene blue stimulated a renewed search for cyanide antidotes, and led to the discovery of a more effective therapy.

Independent investigations in Argentina [7] and the United States [4a] gave rise to a clear-cut conclusion that the combination of sodium nitrite and sodium thiosulfate, consecutively injected by vein, detoxifies cyanides to a marked degree. It was also shown that amyl nitrite, either alone [8] or with sodium thiosulfate,[9] has a similar effect. Individually, each of these simple drugs has been known for some time to have an antidotal action against cyanide poisoning. Pedigo [10] described the antagonism between amyl nitrite and hydrocyanic acid as early as 1888. Detoxification of the same poison by sodium thiosulfate was first demonstrated by Lang [11] in 1895. That sodium nitrite saved dogs poisoned with lethal doses of potassium cyanide was reported by Mladoveanu and Gheorghiu [12] in 1929. Mota [13] successfully treated a human case of cyanide poisoning with sodium nitrite alone. It is the combination of these products that constitutes an improvement of treatment.

EXPERIMENTAL RESULTS

Our own results in dogs are summarized in table 1. Chemically pure sodium cyanide was injected subcutaneously into nonanesthetized animals in various doses. Whenever an antidote was tested, it was administered promptly after the injection of the poison. Amyl nitrite was administered by inhalation, and sodium nitrite and sodium thiosulfate both intravenously. When combinations were employed, sodium nitrite was always injected first. When amyl nitrite was administered, the pearls, one at a time, were crushed in a towel and held over the dog's nose frequently while sodium thiosulfate was being

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1. Geiger, J. C.: Cyanide Poisoning in San Francisco, J. A. M. A. **99**: 1944-1945 (Dec. 3) 1932; Methylene Blue Solutions in Potassium Cyanide Poisoning: Report on Cases 2 and 3, ibid. **101**: 269 (July 22) 1933.

2. Wendel, W. B.: Methylene Blue and Cyanide Poisoning, Correspondence, J. A. M. A. **100**: 1054-1055 (April 1) 1933.

3. Hug, E.: *L'intoxication par l'acide cyanhydrique. Les substances méthémoglobenisantes comme antidotes de l'intoxication cyanhydrique,* Compt. rend. Soc. de biol. **112**: 511-513, 1933.

injected. The treatment was repeated when signs of poisoning reappeared. The object in all experiments was to ascertain the antidotal value and not the prophylactic effect. If the computed median lethal doses (LD_{50}'s) of the cyanide as listed in table 1 are compared, it becomes obvious that the combination of sodium nitrite and sodium thiosulfate is unequivocally the best procedure, raising the median lethal dose of sodium cyanide about 18-fold. It is a definite example of potentiation of action, not merely summation. A similar potentiation is exhibited by amyl nitrite with sodium thiosulfate, although to a less extent. In a few separate experiments the poisoned dogs were allowed to stop breathing for 20 to 30 seconds after the injection of the poison, and then were treated with sodium nitrite and sodium thiosulfate injected intravenously. They all recovered within about 20 minutes.

TABLE 1.—*Comparison of Effect of Antidotes in Cyanide Poisoning in Dogs*

Antidote	No. of Dogs Used	LD_{50} of Sodium Cyanide ± Standard Error, Mg./Kg.	Ratio of LD_{50}'s of Sodium Cyanide in Treated and Untreated Dogs
None	16	5.36 ± 0.28	1
Sodium thiosulfate	11	18.4 ± 0.9	3
Amyl nitrite	13	21.5 ± 1.2	5
Sodium nitrite	13	27.1 ± 3.1	5
Amyl nitrite and sodium thiosulfate	17	60.9 ± 3.0	11
Sodium nitrite and sodium thiosulfate	21	96.7 ± 23.6	18

The mechanism of poisoning and detoxification can be best understood by the following four reactions:

$$\text{Ferricytochrome oxidase} + NaCN \rightleftarrows \text{ferricytochrome oxidase cyanide}$$
$$NaNO_2 + \text{hemoglobin} \rightarrow \text{methemoglobin}$$
$$\text{Methemoglobin} + NaCN \rightarrow \text{cyanmethemoglobin}$$
$$Na_2S_2O_3 + NaCN + O \xrightarrow{\text{Rhodanese}} NaSCN + Na_2SO_4$$

It is well known that cyanide ions prevent the respiratory enzyme, ferricytochrome oxidase, from transporting oxygen to the cells. Fortunately the first equation is reversible as long as the heart continues to beat. The formation of methemoglobin by sodium nitrite is an actual fact, and the methemoglobin can be readily measured (chart). The successful competition for cyanide ions by methemoglobin makes the first equation proceed to the left, and restores the function of ferricytochrome oxidase.[14] The resulting compound, cyanmethemoglobin, can be demonstrated in the circulating blood of treated dogs.[15] It apparently has a low toxicity. Most of the detoxification is accomplished by conversion of the cyanide to thiocyanate under the influence of the enzyme rhodanese.[16] The steady increase of the plasma concentration of thiocyanate can be followed in treated animals, as is well illustrated in the chart. When the nitrite and sodium thiosulfate are used together, it seems that the extent of conversion is much enhanced, thus accounting for the potentiation of the antidotal action. If the amount of the cyanide present in the body is large, the initial treatment may be followed by the dissociation of cyanmethemoglobin into cyanide and methemoglobin. In addition, cyanide ions may be liberated from the thiocyanate, as recently disclosed by Goldstein and Rieders.[17] This explains the recurrence of poisoning signs and the necessity for repeating the antidotes during the course of each experiment.

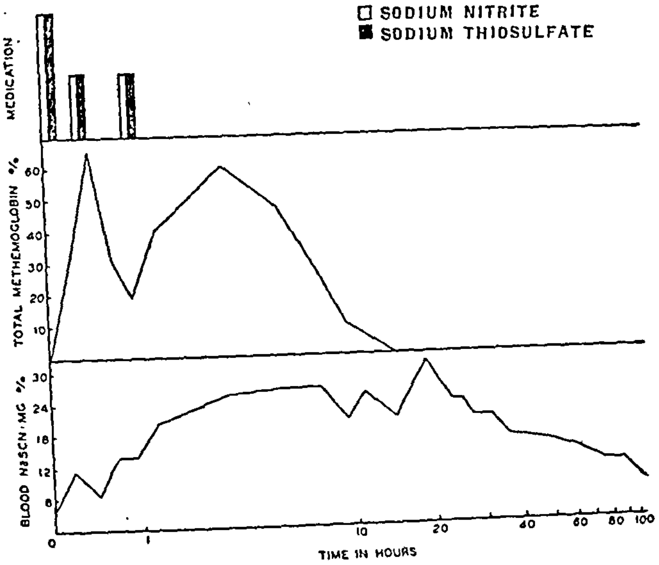

Chart showing methemoglobin and thiocyanate concentrations in the blood of a dog treated with sodium nitrite and sodium thiosulfate for acute cyanide poisoning. The dog, a female weighing 13.25 kg., was given 90 mg. of sodium cyanide per kilogram of weight subcutaneously. Immediately sodium nitrite, 22.5 mg. per kilogram, and sodium thiosulfate, 1 gm. per kilogram, were given by intravenous injections. Because of the appearance of convulsions, the treatment was repeated twice in one-half of the dose 29 and 54 minutes, respectively, after the administration of the cyanide. Methemoglobin and thiocyanate as the sodium salt (NaSCN) were measured spectrophotometrically. As shown in the curves, the methemoglobinemia reached two peaks, amounting to 65 and 60%, respectively. It disappeared in about 11 hours. The formation of sodium thiocyanate steadily increased, reaching a peak concentration of about 31 mg. per 100 cc. of blood. At the end of 103 hours the concentration of the thiocyanate remained at 7.5 mg. The dog regained consciousness two and one-half hours, and ate biscuits five hours, after the injection of the poison.

A SUGGESTED TECHNIQUE

In view of the fact that the physician may be called on unexpectedly to attend a case of cyanide poisoning which is often rapidly fatal, he should be acquainted, in principle or practice, with the following steps in treatment:

1. Break pearls of amyl nitrite, one at a time, in a handker-chief and hold the latter over the patient's nose.

2. Load a syringe with 10 cc. of a 3% solution of sodiu nitrite (0.3 gm.), and another with 50 cc. of a 25% solutio of sodium thiosulfate (12.5 gm.).

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4. (*a*) Chen, K. K.; Rose, C. L., and Clowes, G. H. A.: Methylene Blue, Nitrites, and Sodium Thiosulphate Against Cyanide Poisoning, Proc. Soc. Exper. Biol. & Med. **31**: 250-252, 1933; Comparative Values of Several Antidotes in Cyanide Poisoning, Am. J. M. Sc. **188**: 767-781, 1934. Hanzlik, P. J., and Richardson, A. P.: Cyanide Antidotes, J. A. M. A. **102**: 1740-1745 (May 26) 1934. (*b*) Hug, E.: Methylene Blue in Cyanide Intoxication, Correspondence, ibid. **105**: 1540 (Nov. 9) 1935.

5. Bodansky, O.: Mechanism of Action of Methylene Blue in Treatment of Methemoglobinemia, Correspondence, J. A. M. A. **142**: 923 (March 25) 1950.

6. Steele, C. W., and Spink, W. W.: Methylene Blue in the Treatment of Poisonings Associated with Methemoglobinemia, New England J. Med. **208**: 1152-1153, 1933. Faucett, R. L., and Miller, H. C.: Methemoglobinemia Occurring in Infants Fed Milk Diluted with Well Water of High Nitrate Content, J. Pediat. **29**: 583-596, 1946. Tepperman, J.; Marquardt, R.; Reifenstein, G. H., and Lozner, E. L.: Methemoglobinemic Cyanosis: Report of an Epidemic Due to Corning Extract Substituted for Maple Syrup, J. A. M. A. **146**: 923-925 (July 7) 1951.

7. Hug, E.: Acción del nitrito de sodio y del hiposulfito de sodio en el tratamiento de la intoxicación provocada por el cianuro de potasio en el conejo, Rev. Soc. argent. de biol. **9**: 91-97, 1933; Asociación nitrito-hiposulfito de sodio en el tratamiento de la intoxicación cianhídrica en el perro, ibid. **9**: 197-201, 1933. Acción metahemoglobinizante "in vivo" del nitrito de sodio y del azul de metileno, ibid. **9**: 461-467, 1933. La acción combinada de varios antídotos del ácido cianhídrico, en especial del nitrito e hiposulfito de sodio, ibid. **9**: 572-577, 1933. Buzzo, A., and Carratala, R. E.: El nitrito de sodio y el hiposulfito de sodio como antídotos de la intoxicación determinada por el cianuro de potasio, Semana méd. **1**: 1224-1229, 1933; Nueva contribución al estudio de la acción del nitrito de sodio y del hiposulfito de sodio en la intoxicación determinada por el cianuro de potasio, ibid. **1**: 1966-1969, 1933.

3. Inject the solution of sodium nitrite by the median cubital vein or its substitute, and the solution of sodium thiosulfate through the same needle and vein. Discontinue amyl nitrite inhalation.

It must be realized that speed is mandatory for the treatment of cyanide poisoning. No time should be lost, even though some patients can survive for several hours without treatment. Thus amyl nitrite can be given by any person nearby after being shown the technique. The loading of the syringes can be delegated to a nurse or a qualified assistant. The diagnosis is frequently self-evident from history, but even if it is not completely established and cyanide poisoning is suspected, the recommended therapy should be administered.

If respiration has ceased but heart sounds are still audible by auscultation, artificial respiration should be instituted by the back pressure-arm lift method advocated by De Forest and Potthoff.[18] The handkerchief containing amyl nitrite should be placed next to the patient's nose, for it may hasten the resumption of respiratory movements. If the poison is taken by mouth, gastric lavage must be carried out, preferably by another physician or a nurse. The patient should be observed for 24 to 48 hours. If signs of poisoning reappear or recovery is slow, the injection of both sodium nitrite and sodium thiosulfate should be repeated in full doses.

As a matter of preparedness for the successful treatment of cyanide poisoning, kits containing the following articles may be installed in emergency wards, ambulances, and chemical laboratories: 12 pearls of amyl nitrite; 2 ampuls of sodium nitrite, 0.3 gm. in 10 cc. of water, sterilized by immersing in boiling water for 30 minutes; 2 ampuls of sodium thiosulfate, 12.5 gm. in 50 cc. of water, similarly sterilized; a 10 cc. and a 50 cc. sterile syringe; a 20-gage needle; a file; and a stomach tube.

Both sodium nitrite and sodium thiosulfate decompose in water, but they remain stable for years if some antioxidant such as sodium sulfite is added. Thus, in our laboratory a batch of ampuls of both products made on April 20, 1934, showed almost no changes by chemical assays on Dec. 18, 1951—a period of approximately 17 years and 8 months. Dry ampuls of sodium nitrite and sodium thiosulfate will serve the same purpose. They can be dissolved in water when needed. If ampuls are not available, both chemicals can be weighed out from stock bottles and made into solutions.

REPORT OF CASES

It was difficult to collect many cases of cyanide poisoning in a single locality. Accordingly, we prepared pearls of amyl nitrite, and ampuls of solution of sodium nitrite and sodium thiosulfate, and sent them on request to physicians practicing in large cities. The following case histories were furnished by them:

CASE 1.—A man, aged 24, swallowed a solution containing 2.3% of silver cyanide and 6.9% of sodium cyanide while attempting to start a siphon by mouth. Shortly thereafter he began to feel extremely weak, had a burning sensation in his throat, and felt his heart pounding. Dr. Arthur E. Joslyn, of the Joslyn Clinic, Maywood, Ill., saw the patient, took him to the clinic in his own car, and gave him intravenously 10 cc. of 3% sodium nitrite, and 50 cc. of 12.5% sodium thiosulfate. The time between the ingestion of the poison and the injection of the antidotes was 45 minutes. The patient's stomach was quickly washed out. Before the medication, generalized fine tremors were evident, and the pulse was very rapid. Recovery was obvious in three quarters of an hour; the patient complained only of a headache. He was observed for 24 hours and discharged from the clinic.

CASE 2.—Dr. C. L. Williams, Assistant Surgeon General, U. S. Public Health Service, reported to us the case of a man who was in a barracks in which fumigation with hydrocyanic acid was started at 9:45 a. m. At 10:25 a. m. the patient was noticed lying unconscious across the second story window sill, and was lowered to the ground by means of a ladder. His respiration had ceased. Artificial respiration was applied for over half an hour, and at short intervals during the following hour. Sometime between 10:25 and 11:00 a. m. an unknown amount of methylene blue was injected intravenously by a physician, and the case was considered hopeless because there was no evidence of respiration. Nevertheless the patient was given 0.3 gm. of sodium nitrite and 1 gm. of sodium thiosulfate by vein. At 12:10 p. m. the same doses of the nitrite and the thiosulfate were repeated. He responded to stimuli at 2:15 p. m., became semiconscious by 9:00 p. m., and was fully conscious the next morning. He remained in a good condition for a week, and then developed acute excitement, restlessness, and mania. Large doses of phenobarbital sodium were required to reduce his activity. The patient was bedridden for the next six days. His convalescence was slow. When he was discharged two months later, he still had mild athetoid movements of the hands and personality changes.

CASE 3.—E. R. Sasscer, Division of Foreign Plant Quarantines, United States Department of Agriculture, relayed to us the case of a man attended by Dr. Thurman A. Kinder Jr., at Matamoros, Mexico. The victim, an employee of a private concern, was accidentally poisoned with a cyanide. Details were not available. Dr. Kinder injected sodium nitrite and sodium thiosulfate intravenously, and attributed his patient's recovery to the medication.

CASE 4.—H. S. Dean, Division of Foreign Plant Quarantines, Department of Agriculture, reported to us the case of a customs inspector at Nogales, Ariz., who entered a steel boxcar loaded with 460 sacks of mung beans that had been fumigated with hydrocyanic acid the day before. He inspected the produce for customs purposes. About an hour later the switching crew passed the siding to pick up the car, and some switchmen observed the inspector lying on the sacks. Suspecting cyanide poisoning, they immediately removed him, placed him in a cabin alongside the track, and notified a doctor and the inspector in charge. The latter carried pearls of amyl nitrite with him, and administered one to the patient. The victim promptly recovered; he rested in a hospital bed for a few hours and returned to the customhouse. However, he felt weak for about a month, which was attributable to a variety of causes.

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8. Chen, K. K.; Rose, C. L., and Clowes, G. H. A.: Amyl Nitrite and Cyanide Poisoning, J. A. M. A. **100**: 1920-1922 (June 17) 1933.

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11. Lang, S.: Über Entgiftung der Blausäure, Arch. f. exper. Path. u. Pharmakol. **36**: 75-99, 1895.

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13. Mota, M. M.: Sobre un caso de intoxicación por cianuro de potasio tratado con exito por el nitrito de sodio, Rev. méd. del Rosario **23**: 670-674, 1933.

14. Jandorf, B. J., and Bodansky, O.: Therapeutic and Prophylactic Effect of Methemoglobinemia in Inhalation Poisoning by Hydrogen Cyanide and Cyanogen Chloride, J. Indust. Hyg. & Toxicol. **28**: 125-132, 1946.

15. Mathes, K., and Gross, F.: Über den Nachweis von Methämoglobin und Cyanmethämoglobin im strömenden Blut, Arch. f. exper. Path. u. Pharmakol **191**: 706-714, 1939.

16. Lang, K.: Die Rhodanbildung im Tierkörper, Biochem. Ztschr. **259**: 243-256, 1932.

17. Goldstein, F., and Rieders, F.: Formation of Cyanide in Dog and Man Following Administration of Thiocyanate, Am. J. Physiol. **167**: 47-51, 1951.

18. De Forest, R. E., and Potthoff, C. J.: Back Pressure-Arm Lift Method for Administering Artificial Respiration Recommended, J. A. M. A. **147**: 1454-1455 (Dec. 8) 1951.

combined series of 44, 7 patients subsequently developed one or all three symptoms of headaches, nausea, and vomiting. These may be attributed to the nitrite administration, and can be controlled by appropriate measures.

It is interesting that Williams' two patients experienced a period of excitement and violence after recovery from hydrocyanic acid poisoning—one being reported by himself [29a] and the other being described in this paper (case 2). The reason for this unusual complication is obscure. If cyanide ions had been liberated from thiocyanate that was formed during initial detoxification, they could have caused reappearance of symptoms of cyanide poisoning including excitement and convulsions. The work of Goldstein and Rieders [17] would support such an explanation.

TABLE 3.—*Death Rates* from Cyanide Poisoning*

	Continental United States			New York City			San Francisco	Los Angeles
Year	Suicides	Accidents	Total	Suicides	Accidents	Total	Total	Total
1918	...	..	..	8	2	10	..	..
1919	...	..	..	3	13	16	..	..
1920	...	..	..	10	8	18	..	..
1921	...	..	..	28	7	35	..	..
1922	...	..	..	10	4	14	..	..
1923	...	..	..	18	5	23	..	..
1924	...	..	..	18	4	22	..	..
1925	...	..	..	18	4	22	..	..
1926	...	..	79	13	4	17	9	12
1927	...	..	84	12	1	13	9	24
1928	...	..	108	18	8	26	8	19
1929	...	..	141	22	5	27	10	14
1930	131	3	134	34	3	37	11	18
1931	241	2	243	24	1	25	12	23
1932	374	34	408	44	5	49	21	34
1933	385	31	416	49	7	56	22	33
1934	302	21	323	30	1	31	23	25
1935	332	18	350	36	2	38	14	..
1936	267	18	285	27	0	27	7	..
1937	270	16	286	26	1	27	14	..
1938	273	10	283	26	3	29	15	..
1939	216	22	238	27	3	30	10	..
1940	197	17	214	13	0	13	12	..
1941	141	17	158	15	4	19	10	..
1942	122	13	135	23	2	25	1	..
1943	88	11	99	15	0	15	3	..
1944	83	19	102	7	1	8	3	6
1945	...	..	..	..	..	..	4	10
1946	133	14	147	13	3	16	..	8
1947	125	14	139	7	2	9	2	14
1948	102†	7†	109†	11	2	13	2	15
1949	...	..	..	9	1	10	2	10

* Data were unavailable for the years in which no figures are given.
† From 23 states only.

SOURCES AND INCIDENCE OF CYANIDE POISONING

Sodium or potassium cyanide is widely used in metallurgy for extraction of gold and silver from their ores, in electroplating, in metal cleaning, in organic synthesis, and in removing hair from hides. Hydrocyanic acid is an effective agent for the fumigation of ships, army posts, navy stations, large buildings, flour mills, private dwellings, freight cars, or airplanes that have been infested with rodents and insects. Owing to the incessant warning of manufacturers and care of handling hydrocyanic acid and its alkaline salts by numerous workers, occupational or accidental poisoning has been relatively rare. Government and health department regulations have also contributed to the safety of fumigation. The majority of deaths from cyanide poisoning have been suicidal.

Table 3 is compiled from published data [30] and those privately furnished to the authors.[31] It shows the death rates for 1926-1948 from solid cyanides in the continental United States, and from all cyanides including gaseous hydrocyanic acid for 1918-1949 in New York City, Los Angeles, and San Francisco. Whenever a separation of suicides and accidents is made, it is invariably true that the former outnumber the latter. Almost all deaths from cyanide poisoning in Los Angeles and San Francisco were attributed to suicides. As previously shown,[19] deaths from gaseous hydrocyanic acid are, on the average, more frequently accidental than suicidal, since it is usually handled by fumigators and chemists. It is interesting to observe that the number of cyanide deaths is relatively higher in the two California cities than in New York City or in the whole of the continental United States. For example, the average annual frequency in round numbers per 10,000,000 population of San Francisco was 20 during 1930-1939 based on 1930 census, and 7 during 1940-1949 based on 1940 census. By similar expression for Los Angeles it was 20 during 1930-1934, and 7 during 1944-1949; for New York City, 5 during 1930-1939, and 2 during 1940-1949; and for the continental United States, 2 during 1930-1939, and 1 during 1940-1948. As shown in table 3, death rates from cyanide poisoning have been steadily falling both nationally and in these three cities. Apparently they can be further reduced if the nitrite-thiosulfate therapy is widely employed.

During both world wars, cyanide poisoning was a subject of intensive investigation. The reports of Barcroft [32] and Bodansky [33] bear witness to the active program. It is stated that the French employed hydrocyanic acid shells in the battle of the Somme in 1916.[34] The self-destruction of Nazi leaders with potassium cyanide was also a sequel of the war. Although bitter almonds and seeds of cherry, plum, apricot, and peach may cause cyanide poisoning in man due to the presence of their cyanogenetic glycosides, its occurrence is extremely rare.

COMMENTS

The results recorded in this communication and other publications leave little doubt that patients poisoned with lethal doses of cyanide can be saved by inhalation of amyl nitrite and intravenous injection of sodium nitrite and sodium thiosulfate. Preparedness and speed of action are prerequisites of the success of treatment. The pearls of amyl nitrite and ampuls of sodium nitrite and sodium thiosulfate, wet or dry, should be therefore included in emergency kits. It is particularly fortunate that any person can learn how to administer amyl nitrite in an emergency. The method has brought about recoveries from poisoning by hydrocyanic acid, cyanogen chloride, and the cyanides of sodium, potassium, calcium, and possibly silver. It now remains to be seen whether or not the nitrite-thiosulfate therapy will be as effective clinically as in animals against poisoning by vinyl cyanide,[35] which is used in the manufacture of synthetic rubber. In cases of mercuric cyanide poisoning, additional measures such as injections of dimercaprol (BAL) [36] to combat mercury intoxication are necessary.

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[30] (*a*) Mortality Statistics, Bureau of Census, U. S. Department of Commerce, Washington, D. C., 1926-1933. (*b*) Gettler, A. O., and St. George, A. V.: Cyanide Poisoning, Am. J. Clin. Path. **4:** 429-437, 1934.

[31] Drs. T. F. Murphy and J. C. Capt, Bureau of Census, Department of Commerce, and Dr. Halbert L. Dunn, National Office of Vital Statistics, Public Health Service, Federal Security Agency, Washington, D. C.; Dr. Thomas A. Gonzales, Chief Medical Examiner, City of New York; Dr. Jacob C. Geiger, Department of Public Health, City and County of San Francisco; and Dr. George M. Uhl, Department of Health, City of Los Angeles, supplied all the data in table 3 that have not been published previously.

[32] Barcroft, J.: The Toxicity of Atmospheres Containing Hydrocyanic Acid Gas, J. Hyg. **31:** 1-34, 1931.

[33] Bodansky, O.: Contributions of Medical Research in Chemical Warfare to Medicine, Science **102:** 517-521, 1945.

[34] Prentiss, A. M.: Chemicals in War: A Treatise on Chemical Warfare, New York, McGraw-Hill Book Company, 1937, p. 172.

In veterinary medicine deaths of livestock have occurred after the ingestion of cyanogenetic plants such as arrow grass and chokecherry.[37] Intravenous injection of sodium nitrite and sodium thiosulfate has been recommended for the revival of such poisoned animals.[38]

SUMMARY

Experiments in dogs show that amyl or sodium nitrite and sodium thiosulfate have a potentiating action in detoxifying cyanides. The mechanism depends on (1) the successful competition for cyanide ions by methemoglobin with the respiratory enzyme, ferricytochrome oxidase, and (2) the conversion of the cyanide to thiocyanate. Results of clinical trials substantiate the efficacy of the nitrite and thiosulfate therapy in cyanide poisoning. Successful treatment in 16 cases is reported. To date this method of treatment has been used in a total of 44 cases, with 43 recoveries. The mortality statistics of cyanide poisoning in the continental United States, New York City, Los Angeles and San Francisco, have been reviewed. The incidence is decreasing.

35. Dudley, H. C., and Neal, P. A.: Toxicology of Acrylonitrile (Vinyl Cyanide); Study of Acute Toxicity, J. Indust. Hyg. & Toxicol. **24:** 27-36, 1942.

36. Longcope, W. T., and Luetscher, J. A., Jr.: The Use of BAL (British Anti-Lewisite) in the Treatment of the Injurious Effects of Arsenic, Mercury, and Other Metallic Poisons, Ann. Int. Med. **31:** 545-554, 1949.

37. Couch, J. F.: Poisoning of Livestock by Plants That Produce Hydrocyanic Acid, U. S. Dept. Agriculture, Leaflet no. 88, 1934, pp. 2-4.

38. Clawson, A. B.; Bunyea, H., and Couch, J. F.: Remedies for Cyanide Poisoning in Sheep and Cattle, J. Wash. Acad. Sc. **24:** 369-385, 1934. Clawson, A. B.; Couch, J. F., and Bunyea, H.: The Toxicity of Sodium Cyanide and the Efficiency of the Nitrite-Thiosulfate as a Remedy for Poisoned Animals, ibid. **25:** 357-361, 1935. Hadley, F. B., and Kozelka, F. L.: Antidotes for Hydrocyanic Acid Poisoning, Vet. Med. **30:** 79-81, 1935.

DIAGNOSIS AND TREATMENT OF CANCER OF THE LARYNX

USE OF MEDIAN THYROTOMY, LARYNGECTOMY, IRRADIATION, AND IRRADIATION WITH SURGERY

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All surgeons who treat cancer agree that the most important consideration in its cure is early diagnosis. This applies particularly to cancer of the larynx, since the location of the larynx and the type of malignant lesion that occurs in it make it possible to cure a larger percentage of cancers in this organ than in any other part of the body except the skin. Therefore, it is essential that effort is made in all suspicious cases to secure early diagnosis by careful examination and careful study of the symptoms. The education of the laity toward recognition of the early signs and symptoms of cancer of the larynx is most important. These early symptoms are hoarseness and local discomfort. Emphasis in the lay press and on the radio on hoarseness as a possible danger signal of cancer of the larynx has made it possible for the physician to see many early cases of this type. Cancers that do not produce hoarseness as an early symptom may cause local discomfort in the patient for a long time before he consults a physician, and this form of the disease is usually first seen in a more advanced state. Lymph node involvement may be the condition that brings the patient to the physician, although he may have had local discomfort and even pain for a period of weeks or months. Therefore, local discomfort also needs to be publicized as an early symptom of this type of cancer.

DIAGNOSIS

The symptoms of pain and local discomfort can be correlated with the topology of the larynx. This correlation aids in determining the location in which these early symptoms are produced. The portion of the larynx in which the lesion produces hoarseness may be called the vocal area, and the portion that is not immediately concerned in voice production may be called the silent area The vocal area includes the true vocal cords, the subglottic larynx, and that portion of the larynx that is described as intrinsic. The silent area includes the ventricular bands, and arytenoids, the epiglottis, and the external surface of the larynx. In cancer in the vocal area hoarseness occurs early, and metastasis occurs late. In cancer in the silent area local discomfort and metastasis occur early; therefore, if local discomfort is not recognized as an early symptom of this type of cancer, the lesion is usually far advanced when the patient is seen and frequently involves the ventricular band. These patients usually do not consult a physician until they become hoarse, and by this time lymph node metastasis has already occurred (see figure).

Fortunately, the majority of laryngeal cancers occur in the vocal area and are discovered early. Cancer of the silent area is also amenable to treatment by surgery and irradiation, and early diagnosis in this location is more important than in the vocal area, because the cancer metastasizes early. If we are to make early diagnosis of cancer of the larynx in either the silent area or the vocal area, examination must include complete visualization of the larynx by mirror examination and direct inspection, roentgenographic examination of the neck and larynx, and planographic study. Sufficient time must be spent in observation to determine accurately the presence of cancer. A fleeting mirror glance is not sufficient, even for the experienced physician, to permit an immediate

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for a typical substance by the product of its velocity of sound (c) and density (ρ). The velocity of sound in water is approximately 1.5×10^5 cm. per second and its density, 1 gm. per cubic centimeter. Hence the magnitude of the acoustic impedance of water is 1.5×10^5 gm. per square centimeter per second. Muscle, fat, and glandular tissue all have impedances of magnitudes within 15% of that of water.[2] The impedance of quartz, a common piezoelectric crystal, is approximately 1.1×10^6 gm. per square centimeter per second—nearly 10 times that of water and tissue. The impedance of air, on the other hand, is only 40 gm. per square centimeter per second—less than 1/1000 that of water.

When a plane sound wave strikes the interface between two different mediums, a portion of the wave will be transmitted and a part reflected. The ratio of the reflected to the total energy is given by the value $\left(\frac{Z_1 - Z_2}{Z_1 + Z_2}\right)^2$ where Z_1 and Z_2 are the impedance values on both sides of the interface. When the two impedances are equal, the reflection is zero; hence the transmission of energy is 100%. Roughly 40% of the energy in quartz will be transferred to water or tissue, but only 0.01% from quartz to air and 0.1% from air to tissue. Thus it is apparent that an air space between the source and the tissue must be avoided if effective transfer of ultrasonic energy to the tissue is to be obtained. In sources of ultrasonic energy for medical purposes, the piezoelectric crystal with its electrodes is housed in a metal case with a diaphragm or transmission plate to provide coupling to the crystal. This unit is usually referred to as a transducer. For effective coupling, then, the transducer diaphragm must be pressed against the tissue (fig. 1). Special ointments are frequently used to guarantee an air-free contact between transducer and tissue. Water coupling, obtained by immersing both subject and transducer or by the use of special water couplers, is also satisfactory. Although somewhat less convenient than direct coupling, water coupling has the advantage that a higher ratio of internal to surface heat can be obtained, owing to the cooling effect of the water at the surface. In either method of treatment the continuous presence of a physical therapist is required.

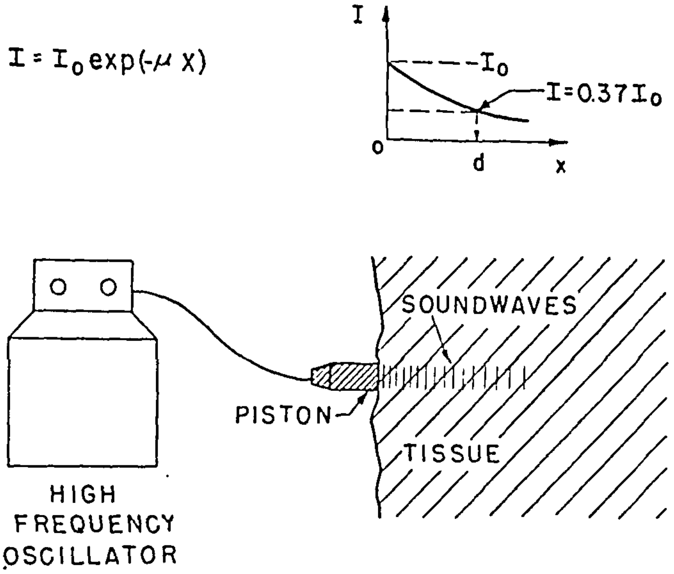

Fig. 1.—Distribution of ultrasonic energy in medium.

TABLE 1.—*Dynamic Properties of a Medium Exposed to Sound**

	Equation	Order of Magnitude
Wavelength λ	$\lambda = c/f$	1 mm.
Maximum pressure (P)	$P = \sqrt{2I\rho c}$	1 atmosphere
Maximum velocity (U) of particle	$U = \frac{P}{\rho c} = \sqrt{\frac{2I}{\rho c}}$	10 cm./sec.
Maximum amplitude (A) of oscillations	$A = \frac{U}{2\pi f} = \frac{1}{2\pi f}\sqrt{\frac{2I}{\rho c}}$	1 μ
Maximum acceleration (B)	$B = U.2\pi f = 2\pi f\sqrt{\frac{2I}{\rho c}}$	100,000 g

* I, sound intensity in watts per square centimeter; f, frequency of vibrations; g, gravitation constant; ρ, density of material; and c, sound velocity. For water and water-like tissues, intensity = 1 watt/cm.^{2} and f = 1 megacycle.

As the sound wave travels through the medium a definite fraction of the energy of motion is transformed into heat in each unit of distance. More specifically, the intensity of the sound at a distance x along the path of a plane sound wave is given by the relation

$$(1) \quad I(x) = I_0 \exp(-\mu x)$$

where I_0 is the intensity of the point $x=0$ and μ is the absorption coefficient, a constant characteristic of the medium (fig. 1). The reciprocal of μ is called the depth of penetration, the distance that the sound wave travels before being reduced to 0.37 of its original value. Table 2 gives values of the absorption for several body tissues and water. These absorption values are constants of the various mediums, independent of the intensity of the sound wave up to levels that are sufficient to produce structural changes in the mediums. The absorption in water is much lower than in any of the body tissues. Hence the water coupling previously mentioned can be used with negligible loss of energy. The absorption in muscle is about twice that in fat. This is an important advantage of ultrasonic heating over electromagnetic diathermy, where the maximum heat production is in the fatty tissues.

TABLE 2.—*Absorption Coefficient μ and Depth of Penetration $1/\mu$ for Body Tissues and Water at One Megacycle*

Substance	μ (Cm.$^{-1}$)	$1/\mu$ (Cm.)	Source
Water	0.0003	3,000	Beranek *
Plasma	0.007	130	Carstensen [3a]
Blood	0.02	50	Carstensen [3a]
Muscle	0.20-0.25	4-5	Pohlman †; Hüter [3b]
Liver	0.17	6	Hüter [3b]
Kidney	0.22	5	Hüter [3b]
Fat	0.13	8	Pohlman †

* Beranek, L.: Acoustic Measurements, New York, John Wiley & Sons, Inc., 1949, p. 76.

† Pohlman, R.: Über die Absorption des Ultraschalls im menschlichen Geweben und ihre Abhaengigkeit von der Frequenz, Phys. Ztschr. 40: 159, 1939.

Measurements[3] have shown the absorption of sound in tissue to be very nearly a linear function of frequency. Consideration of this fact in connection with the depth

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2. Ludwig, G.: Velocity of Sound Through Tissues and Acoustic Impedance of Tissues, J. Acoust. Soc. Am. **22**: 862, 1950.

3. (*a*) Carstensen, E.: Acoustic Impedance of Human Blood, read before the Acoustical Society of America, Washington, D. C., May, 1951. (*b*) Hüter, T.: Messung der Ultraschallabsorption in tierischen Geweben und ihre Abhaengigkeit von der Frequenz, Naturwissenschaften **35**: 285, 1948.

of penetration values of table 2 indicates that, for deep heating, medical ultrasonic equipment must operate at frequencies close to 1 megacycle.[4]

DIRECTIONAL VALUE OF HIGH FREQUENCY SOUND

The pattern of sound intensity in front of a vibrating crystal is rather complicated. Born [5] treats the case of the sound intensity on the axis of a circular piston. His results are shown in figure 2. The sound intensity varies through a series of maxima and minima, reaching the last maximum at a distance $x_0 = R^2/\lambda$ from the piston, where R is the radius of the piston and λ is the wavelength of sound in the propagating medium. We will call the region from the piston to the position x_0 the "interference field" and that beyond x_0 the "distant field." Transition between the two regions is gradual. Figure 3 is a diagrammatic two-dimensional representation of the sound field of a piston. The energy in the interference field is confined to a parallel beam of waves whose cross section is about that of the piston. The intensity within the interference field is a complex pattern of maxima and minima both along the axis and the normal to the axis of the piston. This results from constructive and destructive interference of the individual wavelets generated at the face of the piston. The interference field of some commercial ultrasonic equipment, however, is reported [6] to have a more uniform intensity distribution than that of a simple piston source. When the piston is in direct contact with the tissue, it may be either held stationary or moved gently over the area to be treated. The latter method has the advantage that the strong intensity maxima are moved and that consequently the available power is more evenly distributed over the area to be treated. The effective dose, in watts per square centimeter, is then reduced by the ratio of the piston surface to the area of the tissue treated. Hüter [6] recommends an upper limit of 2 watts per square centimeter for stationary treatment and 6 watts per square centimeter for moving treatment.

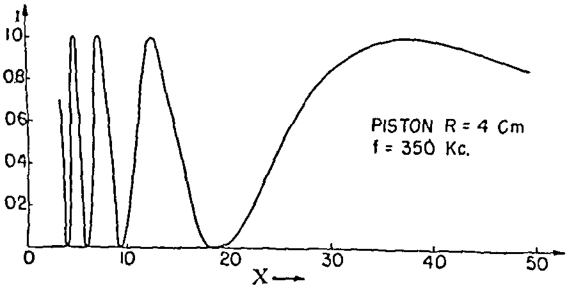

Fig. 2.—Sound intensity along the axis of a circular piston (Born [5]).

In the distant field the waves tend to diverge. The energy, however, can be said to be confined to a narrow cone of angle 2γ, where γ is given by the relation.[7]

$$(2) \quad \sin\gamma = 0.6\,\frac{\lambda}{R}$$

In the distant field the intensity falls as the inverse square of the distance from the piston. It is apparent from the equation that good beaming requires small values for the ratio λ/R. The small values of λ (1.5 mm. at 1 megacycle) compared to the radius of convenient pistons (2 to 4 cm.) make beaming with ultrasound particularly simple.

PRIMARY EFFECTS OF HIGH FREQUENCY SOUND ON TISSUE

Since ultrasound is simply a mechanical vibration, its effects on biologic material must be primarily physical in nature. Thus an explanation of the ultimate biologic effects must necessarily be based on those primary physical processes that are caused by ultrasound in living matter. There are, first, the thermal effects, whose importance in the biophysical problem have been established, and, second, a number of known nonthermal effects that may or may not play a significant role under conditions of treatment.

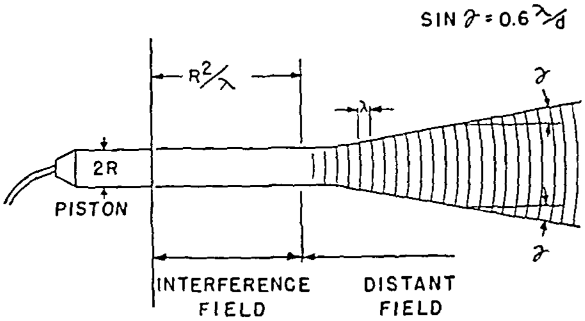

Fig. 3.—Idealized representation of sound field of piston.

The generation of heat in tissue by ultrasonic energy either may take place throughout the volume of the tissue and be accurately characterized by the absorption coefficient μ of equation 1 or may occur in a manner somewhat more complicated because of the presence of abrupt interfaces, as found in many tissues and tissue aggregates. The first phenomenon, a characteristic of completely homogenous fluids and solids, will be called "volume" heating; the second will be called "structural" heating. Volume heating arises from viscous losses, molecular processes, or elastic hysteresis. In structural heating the losses are determined by scattering, by multiple reflections, or by the generation of highly damped shear waves. This classification is, in reality, a distinction between molecular processes and those processes that occur at interfaces whose dimensions are comparable to or greater than the wavelength of the sound. From the medical viewpoint this classification is significant, in that structural absorption may under certain circumstances produce localized heating, whereas with volume absorption the heat production is more uniform.

To what extent these two classes of absorption participate in the heating of the various tissues is not as yet well known. Blood, which contains microscopic structural units in the form of the corpuscles, is perhaps the simplest example. Here the absorption of sound appears to be almost entirely of the volume type. The absorption in normal blood is nearly a factor of 100 greater than the absorption in water. If this is a structural effect due to the presence of blood cells, then the absorption coefficient should be in direct proportion to the concentration of erythrocytes. Instead, recent measurements,[8] summarized in table 3, show that the absorption is in direct proportion to the protein concentration and that whether the proteins are in cells or in solution makes little difference. Further measurements on cell membranes with hemoglobin removed indicate negligible absorption from these structural units.

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[4] The depth of penetration for muscle at 1 megacycle is approximately 5 cm. At 100 kilocycles the depth of penetration would be of the order of 50 cm., which is much higher than that needed for any treatment and hence would have an unnecessarily low rate of transmission of sound to heat energy. At 10 megacycles, on the other hand, the penetration would be approximately 0.5 cm., which is insufficient for purposes of deep heating.

[5] Born, H.: Zur Frage der Absorptionsmessung im Ultraschallgebiet, Ztschr. f. Physik **120**: 383, 1943.

[6] Hüter, T.: Physikalische Betrachtung zur Applikation und Dosierung von Ultraschall, Ärztl. Forsch. **3**: 585, 1949.

[7] Morse, P. M.: Vibration and Sound, ed. 2, New York, McGraw-Hill Book Company, Inc., 1948, p. 328.

Hüter,[3b] on the other hand, found that the absorption coefficient for tongue muscle depended on the direction of incidence of the sound relative to the orientation of the muscle fibers. He suggested that this structural absorption may arise through the action of shear processes.

In solids, including tissues, shear waves, in which the deformation is a twisting or shearing of the medium, may be propagated. Sound waves in fluids, on the other hand, are entirely compressional, i. e., the deformation of the medium consists only of condensations and rarefactions of the medium caused by motion of the particles parallel to the direction of propagation of the wave. These two waves have different velocities and absorption coefficients. The reflection of a pure compressional wave from an interface will be a complex combination of compressional and shear waves. The shear wave may be expected to decay rapidly, thus producing localized heating in the region of the interface. It is to be anticipated that this localized heating will occur wherever reflecting surfaces exist, especially at large impedance discontinuities such as muscle-bone and muscle-tendon interfaces. Nelson[9] reported temperature rises in the bones of living dogs five times the rise in surrounding tissue. This presumably is an example of structural heating. Lehmann,[10] in investigating the effect of ultrasound on the permeability of macroscopic membranes, found a selective temperature rise in the membrane.

TABLE 3.—*Absorption Coefficient for Blood and Blood Components*

Frequency, Mc./Sec.	Temperature (C.)	Substance	Protein, Gm./100 Cc.	Measured Absorption, Db./Cm.	Absorption per Gm./100 Cc., Db./Cm.
1.2	20	Plasma	5.5	0.08	0.014
		Red cells	32.0	0.40	0.013
		Hemoglobin	7.0	0.09	0.013
		Albumin	12.5	0.16	0.013
1.2	40	Plasma	5.5	0.07	0.012
		Red cells	32.0	0.31	0.011
		Hemoglobin	7.0	0.08	0.011
		Albumin	12.5	0.14	0.011
2.4	20	Plasma	5.5	0.16	0.030
		Red cells	32.0	0.91	0.029
		Hemoglobin	7.0	0.17	0.024
		Albumin	12.5	0.31	0.027
2.4	40	Plasma	5.5	0.13	0.023
		Red cells	32.0	0.77	0.024
		Hemoglobin	7.0	0.15	0.021
		Albumin	12.5	0.29	0.023

This localized heating at interfaces, characteristic of ultrasonic diathermy, has no parallel in other forms of energy therapy, such as electromagnetic diathermy or pure conduction heating. It is very important clinically to ascertain that the sound intensity at the bone is at a safe level either by properly directing the sound beam or adjusting the intensity to reduce it to a safe level by absorption in the tissues before reaching the bone.

The following nonthermal effects may or may not play a role under the conditions of therapeutic treatment:

1. *Increase of Membrane Permeability.*—Lehmann[10] reported evidence that the permeability of a macroscopic membrane under ultrasonic radiation is increased beyond that which can be explained by the heating of the membrane. He explained this by the stirring action of sound on the solution of both sides of the membrane and consequent increase in the gradient of the ion concentration near the membrane.

2. *Resonance Effects.*—Gas bubbles in liquid are known[11] to oscillate radially when subjected to a sound field. The amplitude of oscillation increases sharply when the frequency of the sound field coincides with the natural or resonant frequency of the bubble. Lehmann[12] reported observing the destruction of the erythrocytes of blood by these resonant gas bubbles in the sound field. Ackerman observed the resonant destruction of paramecia and erythrocytes of several kinds of blood,[13] which he explained on the basis of complex oscillations of the cells.

3. *High Intensities.*—High intensities of sound may produce changes of state in the medium by formation of gaseous cavities (cavitation) or breaking long-chain molecules (depolymerization). The intensities at which these and similar effects appear in biologic material is not yet known.

COMPARISON WITH OTHER FORMS OF HEAT THERAPY

With our present knowledge we are led to conclude that the effect of ultrasonic energy on tissue is primarily thermal. The value of ultrasound as a new tool of physical medicine, therefore, lies in its ability to develop heat inside the human body. The advantages and limitations of ultrasonic therapy as compared with other methods of heat application, such as surface heating and ultra high frequency diathermy, will now be discussed.

Suppose we wish to heat the volume V of tissue inside the body as it is shown in figure 4. The rise in temperature in V may be due to one or both of the following causes: (1) flow of heat by conduction from the surface that is exposed to the heat generator or (2) transformation of radiant energy (ultrasonic or electromagnetic) to heat within the volume itself. It follows from mathematical analysis[14] that the temperature rise from the first cause is roughly half the surface temperature rise if the distance from V to the surface is equal to the radius of the heated surface area. This should give a relatively high depth of penetration for large contact heat sources, such as is possible with hot packs and infrared rays. But heat conduction is a relatively slow process; hence, in a living subject, the flow of blood rapidly carries away the heat. In practice, therefore, depths of penetration for infrared rays are of the order of 2 cm.[15] It follows, that to create a temperature rise in deep tissue the heat must be produced within the tissue by absorption of radiant energy.

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[8] Carstensen, E. L.; Schwan, H. P.; Piersol, G. M., and Pennell, R. B.: Mechanism of Absorption of Ultrasonic Energy in Blood, A. M. A. Arch. Phys. Med., to be published.

[9] Nelson, P. A.; Herrick, J. F., and Krusen, F. H.: Temperatures Produced in Bone Marrow, Bone and Adjacent Tissues by Ultrasonic Diathermy: Experimental Study, Arch. Phys. Med. **31**: 687, 1950.

[10] Lehmann, J.; Becker, G., and Jaenicke, W.: Über die Wirkung von Ultraschall-Wellen auf den Ionendurchtritt durch biologische Membranen als Beitrag zur Theorie des Therapeutischen Wirkungsmechanismus, Strahlentherapie **83**: 311, 1950.

[11] Carstensen, E., and Foldy, L.: Propagation of Sound Through Liquid Containing Bubbles, J. Acoust. Soc. Am. **19**: 481, 1947.

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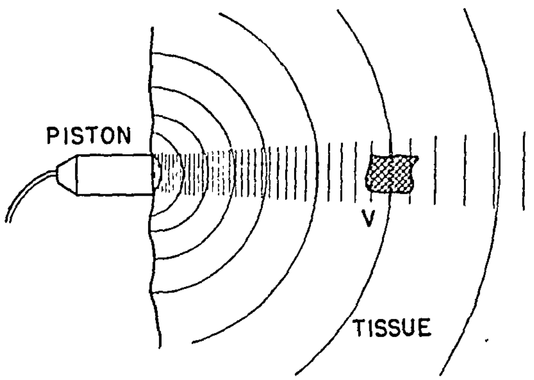

Fig. 4.—Illustration of depth penetration (see text).

Deep heating with microwaves or sound waves can be considered effective only when the depth of penetration of the radiant energy is higher than the depth of penetration that is obtained simply by heat flow from the surface. Figure 5 shows the depth of penetration of electromagnetic radiation in tissue with high water content such as muscle.[16] The depth of penetration decreases with wavelength and becomes smaller than 1 cm. for wavelengths less than 10 cm. (frequencies above 3,000 megacycles). Above this frequency diathermy would offer little advantage for deep heating over infrared and other methods of surface heating. This suggests the use of low frequencies to provide sufficient depths of penetration. However, the ratio of heat developed in fat to that in muscle increases with decreasing frequency. Thus decreasing frequency actually leads to an effective reduction of heat in the muscle tissue. Ultrasound, on the other hand, provides adequate depths of penetration and yet has its maximum absorption in muscle.

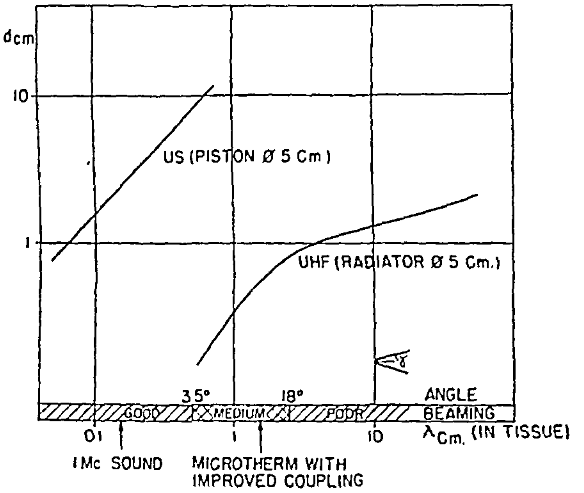

Fig. 5.—Depth of penetration and beaming for ultrasound and microwave diathermy.

If, in addition to generation of heat in the deep tissues, it is required that the energy be localized, ultrasound has a further superiority over electromagnetic diathermy. The relation between sharpness of beam and wavelength, discussed earlier, applies to electromagnetic as well as ultrasonic waves. The depth of penetration obtainable with various beam widths in the two instances is shown in figure 5. The wavelength scale is divided arbitrarily into three sections, "good," "medium," and "poor" beaming. A good beam is defined as one in which the energy is concentrated within an angle of 7 degrees (i. e., $\lambda < 0.1$ R); a medium beam may be up to 36 degrees ($0.1 R < \lambda < 0.5 R$); the beaming is considered poor when λ exceeds 0.5 R.

In view of the fact that an effective depth of heat penetration of several centimeters can be obtained merely with surface heating, it may be concluded that any form *of energy that does not provide penetration* of at least 2 cm. in tissue is not suitable for deep heating. It is obvious that, in the case of electromagnetic waves, beaming requires much shorter wavelength than permissible in the interest of penetration, but that sound offers both penetration and good beaming. The advantages and disadvantages of sound as compared with ultrahigh frequency diathermy are summarized in table 4.

TABLE 4.—*Comparison of the Characteristics of Ultrasound and Microwave Diathermy*

Ultrasound	Microwave Diathermy
Beaming good	Beaming poor
Efficient transfer of energy to tissue from source	Poor transfer of energy into tissue with present equipment
Depth of penetration good	Depth of penetration too small
Absorption in muscle greater than in fat	Heating of fat greater than muscle
Dosage determination fair	Dosage determination poor
Selective heating at interfaces	No selective heating at boundaries
Irreversible effects (cavitation) above critical energy levels	....
Nonthermal effects possible	Pure heat therapy
Indications not well established	Indications well known

CONCLUSIONS

At present the role of nonthermal effects of high frequency sound in medicine has not been evaluated. This provides an incentive for research but is actually a deterrent to the immediate clinical application of the technique. The transfer of sound energy into heat can be due to either volume heating or structural heating; the absorption of sound in the body by the protein molecules is an example of the first; the localized heating of muscle-bone interfaces is an example of the second type.

There are both limitations and advantages in the use of the heating properties of ultrasound. Because of the coupling problem, the application of sound to tissue requires constant attention by the physical therapist. The localized heating of tissue interfaces may constitute an actual hazard unless used properly. On the other hand, ultrasound offers simultaneously high depth of penetration and good beaming. This combined with high absorption in muscle as compared with fat makes ultrasound especially suitable for localized deep heating.

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SAVING TAXES THROUGH ESTATE ANALYSIS

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In my last article in THE JOURNAL [1] I gave a brief picture of the field of estate analysis and the need for sound, constructive planning. In this discussion I would like to go further and deal specifically with the large losses physicians suffer in their lifetimes and their estates suffer at their deaths, losses which are at least partially avoidable.

We are all familiar with the history of England in the last few decades in its attempts to wipe out the so-called landed gentry through a system of confiscatory taxation. It has resulted in leveling out of the economic strata so that there are few persons of great wealth, although the system has not, apparently, decreased the number of the very poor. As the Committee on Ways and Means of the House of Representatives stated in its minority report on the Revenue Act of 1951 (H. R. 4,473),[2] "We are opposed to this short sighted policy of further soaking the lower income groups tomorrow by destroying the middle and upper income brackets taxpayers today. This policy was followed with disastrous results by the Socialist Party in England and the result is that today the tax burden in England has to be shouldered by the lower income groups."

Yet that is the path of the United States in our generation. In the case of a man who leaves a two million dollar estate to his son, who in turn leaves it to his children, the estate, after deducting taxes and expenses, together with estimated shrinkage of 20%, will reach the grandchildren as approximately $335,000. Over $1,600,000 will vanish in the brief interval of the son's survival of his father, even though the son spends not $1 of the money received by him.

The income tax problem is equally acute. Since January, 1952, the physician making $14,000 a year, except in so far as his tax is modified by split-income or head of household provisions, has been in the 50% bracket. If making $50,000 he is in the 74% bracket. If $100,000, he is in the 87% bracket. For these reasons, tax savings are more important than ever today. Sound planning may easily effect a death savings of $100,000 or more to the physician's estate. It is more important to "save" than to "earn." For example, to earn enough money in one year to have $100,000 net remaining after taxes, the physician would have to receive a net income, after expenses, of approximately $590,000. There is no tax on his frugality or wisdom, however, in saving a like $100,000 by constructive foresight.

In fact, the federal government encourages the taxpayer to plan wisely. It expects the taxpayer to play fair; duplicate sets of books, false entries, unreported income, or overstatement of expenses will all produce heavy penalties and provide a shortcut to Leavenworth. But sound, honest planning is encouraged with excellent governmental cooperation. In fact, while one may not deduct as an expense the drafting of a will by a family lawyer, he may deduct the cost of most services given by a competent estate analyst. Therefore, in many cases, the government is paying half or more of the expense incurred in securing tax savings advice. The following discussion will be broken down into two primary sections, dealing with estate losses and income taxes, respectively, with appropriate subsections.

ESTATE LOSSES

There are four primary losses that reduce the value of the estate left by a physician, even if claims or debts of the decedent are eliminated. These losses are (1) estate taxes, (2) inheritance taxes, (3) administration expenses, and (4) estate shrinkage. Let us look at each of these briefly.

Estate tax computations permit an exemption of $60,000. Above that exemption, the rates start at 3%, rising to 28% at the $100,000 mark, with an ultimate top of 77%. All assets of the decedent are taxable, except for amounts left to charity. Even insurance that he has purchased on his life for his family's benefit, and joint tenancy properties, for which he paid the purchase price, are taxable in his estate. Inheritance taxes vary from state to state, and depend on the degree of relationship between the decedent and those receiving his assets. Normally, they may be considered as averaging out at around 6%. Administration expenses, again, vary from one state to another, and may depend partially on the size of the estate and the persons acting as executor and as attorney. Usually such expenses will fluctuate from as high as 15% (in a small estate) to approximately 5% in a larger estate.

It will be seen that in any substantial estate, the aggregate of these items is large, frequently taking over half the net estate. Yet there is still another factor that must be considered, and that is "estate shrinkage." This is fairly simple to explain. Everyone has heard of bargain purchases of such properties as houses and farms through estates. If they are bargains to the purchaser, they represent losses to the seller, which is the estate. A large, beautiful home, for example, may be an object of pride in a man's lifetime; it is an expensive white elephant in his estate. Farm land, during depressed economic periods, may be a white elephant; vacant residential lots almost always are frozen assets. Stock in close corporations, partnership assets, and the like frequently leave the heirs at the mercy of others, so far as liquidation is concerned. Shrinkage loss may run as high as 40%; it seldom is less than 10%. In the estate of around $500,000, which is moderately nonliquid, average shrinkage could be estimated at 18%. This would mean a loss of approximately $90,000, not counting taxes and administration expenses, to such an estate.

How can such losses be reduced? There is no simple answer to the problem of avoidance of these losses. Each estate plan must be tailor-made to fit the needs of the particular client whose problems are involved. However, certain general principles are employed with great frequency. An explanation of them may help the physician to understand the problems.

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[2] H. R. 586, 82d Congress, 1st Session.

The chief methods of reducing such losses are (1) by reducing the estate during the physician's lifetime; and (2) skipping generations or potential future taxable estates, so as to avoid like future losses to those who inherit from the physician. The ideal solution would be if all assets could be placed in a trust company, which, as owner, would pay income to successive beneficiaries, so that these persons would personally own no assets to be taxed in their estates. But the law does not permit such a solution, in toto. Various statutes prevent this result because the governmental bodies would otherwise lose such taxes and the equitable title to property would be nonvested for long intervals.

Since the ideal cannot be accomplished, as suggested, the taxable estate may be reduced by other means. Lifetime gifts to the members of one's family, including a wife, to take advantage of gross gift tax exemptions and annual exemptions may be of benefit, if used wisely. Sales of certain properties and the use of trusts may help. Take the simple matter of one's own home. If the physician and his wife hold it in joint tenancy, and he has furnished the purchase price, the entire value is taxed in his estate should he die first. If they hold it as tenants in common, only one-half is taxed in the physician's estate; if it is in her name alone, no part is taxed in his estate. This rule varies in community property states.

If the physician is a member of a medical partnership or clinic and the value of his interest is not concretely fixed by a "buy and sell" agreement, the estate may be plunged into expensive litigation. In the case of Dr. Edward Starr Judd, of the Mayo Clinic, the tax commissioner increased the valuation of his interest, as reported by the executor, by almost half a million dollars, and the resulting litigation held his estate open more than three years following his death.

It is not difficult for the physician to cut his own estate drastically during his lifetime, to establish estate liquidity, or to enter into proper partnership valuation and sale agreements. He must, however, be willing to accept expert counseling and cooperate in making effective the suggested plan. The wise use of available techniques may save tens of thousands of dollars. Following are a few illustrations, based on only one of many devices available, namely, life insurance:

1. If a physician leaves much of his property outright to his wife, a certain portion (called the marital portion) may escape taxation in his estate but it will be subject to taxation in her estate. If, however, her portion were left in the form of life insurance proceeds, payable to her during her lifetime, it would still escape taxation in his estate; in addition, however, it would be consumed during her lifetime, leaving nothing of such fund to be taxed in her estate.

2. If a physician purchases insurance on his own life, the proceeds are taxable in his estate. If his wife or children purchase insurance on him, however, and pay the premiums from their own funds, the proceeds are tax exempt. But if he gives them property to provide an income for this purpose, or money with which to pay the premium installments, it again becomes taxable. Therefore, the utmost care must be used in the selection of insurance plans.

3. His son may marry, and work for a small salary. It would be possible to make gifts to the son, but these, then, become taxable in the son's estate upon his son's death. The son needs some form of security for his family, but would be hard pressed to pay insurance premiums. In such event he would definitely have to skimp, resulting in the young people having to forego many pleasures. Grandfather, the physician, may create a trust, permitting the trustee to buy insurance on the life of the son, whereby the proceeds at the son's death may be used for the benefit of his widow and children. By this method, the amount of the premiums reduces the physician's estate; the proceeds are also not taxable in the son's estate; and a worth-while result is accomplished.

These are only a few examples of the innumerable possible methods of reducing estate losses. Usually, estate shrinkage losses may be avoided completely by wise planning; taxation and other losses may be sharply reduced. But even as "procrastination is the thief of time," delays on the part of the physician in taking steps toward a proper analysis and a sound plan make it increasingly difficult to accomplish these ends.

INCOME TAX LOSSES

One of the few good things to come out of Washington tax legislation in recent years has been the "split-income" method of income tax reporting. It helps to equalize the situation between community and noncommunity property states. But it is not a panacea. With rapidly mounting living costs and tax rates, it is increasingly difficult to establish any measure of financial security.

The principal causes of loss to physicians in this regard arise from several general errors: (1) failure to split his tax basis among sufficient persons; (2) paying on the basis of maximum revenue during highest productive years, instead of postponing tax incidents until retirement or less active years; (3) improper approach to an investment program; and (4) failure to take advantage of the benefits of gift and estate tax avenues.

APPROACH TO INCOME TAX SAVINGS

Again, the avenues for tax savings are many, so that it becomes impossible to lay down general rules for all cases. The problems are personalized ones; what is sound in one case may be suicidal in another. However, a few possibilities may serve to indicate that savings can be effected, when combined with constructive planning.

1. To reduce tax brackets, income may be divided. For example, the physician may be in a 60% bracket and his son in a 30% bracket. If the physician owns an apartment building that produces $5,000 annual net income, he pays $3,000 of this to the government. His son would pay only $1,500 in taxes. Therefore it would be better to give this income property to his son. On the other hand, it may be still better to give it to a trustee for the benefit of the son and his family, with an appropriate fiduciary return as to undisbursed income.

If the physician is paying $100 a month to support his sister, he may have to earn $240 a month in order to obtain that money. It may be better for him to purchase an annuity for her, or to buy a piece of income property that will bring her in the necessary funds, and let her pay a very small income tax. The creation of other trusts, or the conveyance of income producing assets, may spread tax incidents among many lower bracket taxpayers.

2. Instead of thinking of investment income, one must adopt a new concept in his thinking, that is, the concept of "capital gains." It is based on the principle of "buy low and sell high." The income tax laws give a preference to the successful speculator over the wage earner. While the latter may pay as much as 89% upon his earnings, a long term capital gain will not be taxed to exceed 26%. Therefore, it is better to buy and to resell, and to repeat successfully, than to count on dividend income. In the case of deflated investments, one should time the period of their disposition to offset capital gains.

3. In the case of securities and investments that have advanced markedly in value, and particularly in the case of investors advanced in age, there is another possibility. If one is planning to make a gift to charity, it is better to give a security that has appreciated in value; no capital gains tax will probably be due, although the government is trying desperately to alter this result. Similarly, if the inflated security winds up in the decedent's estate, although it becomes subject to estate tax, no income tax is due on its increase in value prior to the decedent's death. Therefore, one planning an alteration in the portfolio of an aged client should consider the various incidents from a tax point of view in determining the retention or liquidation of each security.

4. Another new term the client must learn is that of "depreciation." Personally, I do not favor investments in rental housing property, because of constant governmental interference on behalf of the so-called downtrodden tenant. I do like sound business rental property with which the government does not meddle. Here the investor can keep his property in sound repair and charge off his expenses in this regard. He can also depreciate such property over a reasonable period of years —the shorter, the better. Thus, the depreciation items each year result in tax free income, though they reduce the cost basis of the property. However, it is better to pay on a capital gains basis of 26% on reselling the property after five or six years than to pay on a 65% basis from year to year.

5. Two other terms are "depletion" and "business losses." Uncle Sam encourages businessmen to take fliers in wildcat oil wells. It will be remembered that in my last article in this publication, I discouraged the young physician from such speculations. The practitioner who has achieved security for his family is in a different position. He has a right, then, to take a gamble, provided he uses ordinary common sense in selecting his spots for speculation and persons with whom he associates in such ventures. Assume he is in an 80% income bracket. If the well hits, he may deduct 27.5% of each royalty check as "depletion" or tax-free income and pay tax only on the remaining 72.5%, which makes a net rate, on the entire royalty, of 58% instead of the 80% applicable to other income. If he loses on his gamble, the physician

e off his entire investment as a business loss. In

the government has paid four-fifths of the

6. One should postpone income until lower tax years. Obviously it is better to receive more income when one's bracket is 30% than when it is 65%. One should be building for those leaner years following retirement or a partial cessation of activity. These may be illustrated in a few simple ways.

If one buys stock returning 6% upon the investment, he will have only 2% net after taxes if he is in a 65% bracket. He may, however, buy endowment insurance policies. The dividends upon them are not subject to income tax. Then, before they mature, he may elect to receive the proceeds in fixed amounts over a specified number of years. He pays no tax on these annual payments, although they include interest, until he has recovered his original cost; the remaining payments will normally fall in lower income years.

If he is a member of a clinic or multiple partnership, an important approach is to make proper deferred compensation contracts. Thus, instead of receiving $75,000 a year during periods of high productivity and paying tax on this entire amount, arrangements may be made to receive $50,000 a year during the period of his association and $25,000 a year thereafter. The organization can take out insurance payable to it to provide a fund with which to discharge these later obligations.

SUMMARY

These are only a few of the problems, and a few of the possible solutions. They do illustrate the gravity of the situation confronting any practicing physician; yet they demonstrate also that much can be done to alleviate his problems. Each situation must be handled individually. No two cases are alike; the problems of clients differ markedly. The family attorney, the friendly accountant, or the trust officer with whom one plays golf may be the finest people in the world, but they are not necessarily equipped to solve these problems. Dr. Blank may do a fine job removing tonsils; on the other hand he may know nothing of a vaginal hysterectomy. Nor would he be trained in the bombardment of a malignant tumor. The estate analyst, though he be a lawyer, may not be able to defend a criminal or to contest a boundary line dispute, but he is skilled in the problems peculiar to his field. With some thought and the assistance of specialists, the physician can accomplish great savings and add materially to his own and to his family's security. And the resulting peace of mind is invaluable.

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Methyl Alcohol Poisoning.—The clinical picture of methyl alcohol poisoning may be confused with acute surgical disease of the abdomen and with cerebrovascular accident. Acidosis should suggest methanol as a possible etiologic agent. Hyperemia of the optic disc is an extremely useful sign if present. One point that merits constant reiteration is the importance of acidosis as an indication of the severity of poisoning and necessity for prompt and vigorous alkalinization in therapy. The true significance of acidosis in methanol intoxication is unknown, but the frequent prompt subsidence of symptoms with restoration of serum bicarbonate suggests that it may be the specific metabolic derangement responsible for the intoxication.—Manuel N. Cooper, M.D.; George L. Mitchell Jr., M.D.; Ivan L. Bennett Jr., M.D., and Freeman H. Cary, M.D., Methyl Alcohol Poisoning: An Account of the 1951 Atlanta Epidemic, *Journal of the Medical Association of Georgia*, February, 1952.

CEREBRAL APOPLEXY DUE TO SPONTANEOUS INTRACRANIAL HEMORRHAGE

REPORT OF TWENTY-THREE CASES

Michael Scott, M.D., Philadelphia

The mortality from the "conservative" treatment of spontaneous nontraumatic intracranial hemorrhage is discouraging to physicians who see other previously fatal conditions respond to newer techniques in surgery, to antibiotics, and to certain hormones. This type of hemorrhage may occur in the subarachnoid space, or it may originate in the cerebrum, but rarely in the subdural space.[1] Spontaneous subarachnoid hemorrhage is usually caused by a leaking or ruptured aneurysm within or contiguous to the subarachnoid space. The diagnosis and treatment of this catastrophe, at times associated with hemorrhage into the brain substance, is a problem worthy of detailed discussion [2] but is not the purpose of this paper. This presentation is primarily concerned with the results of surgical treatment of spontaneous hemorrhage into the brain substance, which in many instances causes symptoms of a "stroke."

It would be helpful to know, for comparison, what percentage of patients with proved intracerebral hemorrhage treated medically recover. However, without surgery or necropsy, verification would be impossible. One could perhaps secure such a series by cerebral angiography, which might show characteristic displacement of the cerebral vessels and thus give indirect evidence of a clot; however, the results might be the same if a tumor were present. To my knowledge, there is no report on an adequate number of cases in which cerebral angiography suggested an intracerebral hematoma, operation was not done, and the patient recovered. The alternative, therefore, is to review mortality statistics on cases of intracerebral hemorrhage that were followed clinically and verified at necropsy. Aring and Merritt have done this in 116 cases.[3] They found that 8% of the patients died within 24 hours, 41% within one to four days, 38% within five to 14 days, and 11% in two weeks to two months. Rose reported 205 cases of intracranial hemorrhage carefully studied at necropsy. Eighty per cent of the patients died within 24 hours.[4] Zimmerman analyzed the records and the necropsy material in 107 cases in which death was due to spontaneous intracerebral hemorrhage. Ninety-four per cent of the patients died during the first attack, and all were dead within five weeks of the onset.[5]

There are undoubtedly patients with intracerebral hemorrhage treated medically who show partial or complete recovery; however, they are the exception rather than the rule. Cushing in 1903 recognized the hopelessness of the expectant treatment and stated, "In spite of the unfavorable results following operations in both my cases, the temporary amelioration of the severe symptoms is a sufficient justification for future attempts to afford surgical relief to certain carefully selected cases." [6] Since Cushing's report there have been many other reports on the successful removal of these hematomas.[7] Figure 1 lists cases of surgically treated spontaneous intracerebral hemorrhage that I found in the literature. In 19 separate reports, only three authors list more than five cases. The mortality rate varies considerably, owing to the location and rapidity of the hemorrhage; in only a few cases was hemorrhage reported in the internal capsule. In my series, approximately 50% of the hemorrhages occurred in this location.

The cause of the hematoma is frequently obscure. It is one thing to remove a clot, examine the cavity, and report what was seen at operation and another to examine at leisure the entire brain grossly and microscopically. For example, a review of the 105 cases of intracerebral hemorrhage proved at operation by others (fig. 1) reveals that the cause was not found in 95; subacute endocarditis was the cause in two; aneurysms were discovered in four; and brain tumor was seen in four. An analysis of 23 cases, in which surgery was done, reported in this paper, shows that the hematoma was caused by a rupture of an artery with no visible aneurysm in three cases; an aneurysm of the right middle cerebral artery was found in one; a brain tumor was found in two; and no obvious cause could be found in the remaining 17 cases. Robertson,[7j] who examined the brains of 93 patients who died of intracranial hemorrhage and who were given clinical diagnoses of subarachnoid hemorrhage, found aneurysms in every case; in 60% there was massive intracerebral hemorrhage associated with the subarachnoid hemorrhage. Zimmerman,[5] who sectioned the brains in 107 cases of spontaneous massive cerebral hemorrhage, found 14 cases of saccular congenital aneurysm, 8 of intracerebral tumor, 2 of cerebral arteritis (both due to subacute bacterial endocarditis), 2 of blood dyscrasia, and 81 of widespread cerebral atherosclerosis. It was Zimmerman's belief that rupture of a miliary dissecting aneurysm of an atherosclerotic cerebral artery was the pathogenesis of the apoplectic attack in 75% of the cases. Margolis and his associates recently reported that minute angiomatous malformations in the cerebrum can produce spontaneous hemorrhage.[8]

Figure 1 appears only in the author's reprints.

From the Department of Neurosurgery, Temple University Hospital and Medical School and the Jewish Hospital.

Read before the Section on Nervous and Mental Diseases at the One-Hundredth Annual Session of the American Medical Association, Atlantic City, June 15, 1951.

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The presence of severe hypertension must be considered as a predisposing and important factor. Aring and Merritt stated that a systolic blood pressure greater than 200 mm. was present in 41% of their cases of cerebral hemorrhage and in only 26% of their cases of cerebral thrombosis.[3] However, they pointed out that cerebral hemorrhage or thrombosis is not rare in a patient with normal blood pressure. Of the 64 cases in which operation for intracerebral hemorrhage was done by others, in only 18, or 28%, was there a history of definite hypertension. However, in my series of 23 patients, 12, or 52%, had such a history.

The following outline lists the known causes for spontaneous intracerebral hemorrhage.

1. Aneurism of the cerebral arteries
   - A. Congenital (most common)
   - B. Atheromatous
   - C. Mycotic (infection)
2. Arteriosclerosis
   - A. Simple rupture associated with hypertension
3. Infections, weakened vessel wall (arteries and veins)
   - A. Acute and subacute
     1. Systemic
     2. Meningitis
     3. Mycotic emboli (subacute bacterial endocarditis)
     4. Exanthema (violent coughing)
     5. Thrombophlebitis of cerebral veins and dural venous sinuses
   - B. Chronic
     1. Syphilis (uncommon)
4. Blood Dyscrasia
   - A. Hemophilia
   - B. Purpura
   - C. Pernicious anemia
   - D. Polycythemia vera
5. *Avitaminosis*
   - A. Vitamin C (scurvy, alcoholism)
   - B. Vitamin B (Suter)
6. Varices of cerebral and dural veins
7. Eclampsia (with severe renal changes)
8. Brain tumor
   - A. Hemorrhage into primary brain tumor (glioma)
   - B. Metastatic melanotic sarcoma
9. Exogenous toxins
   - A. Antihelminthic (Aspidium filix-mas)
   - B. Chronic lead intoxication
10. Minute angiomatous malformation in cerebrum

DIFFERENTIAL DIAGNOSIS

The differential diagnosis of spontaneous intracerebral hemorrhage from cerebral thrombosis is important. The use of stellate block, heparin, or bishydroxycoumarin, as advocated by some for cerebral thrombosis or embolism, might prove disastrous in cerebral hemorrhage. Conversely, intracranial surgical intervention in cerebral thrombosis is useless except in rare instances, in which the associated cerebral edema or secondary hemorrhage produces a problem in increased intracranial pressure that is not relieved by nonoperative methods. Table 1 lists the important differential points in these conditions. Occasionally differentiation between intracerebral hemorrhage and thrombosis is extremely difficult and may be impossible without cerebral angiography.

Gross and Wechsler have advocated prompt angiography in every case of suspected intracranial hemorrhage. They believe that its value diagnostically exceeds any potential risk from the dye.[7k] The angiogram may show a characteristic displacement of the cerebral arteries, which will corroborate the diagnosis of a clot or other space-taking lesion (fig. 2). It may show an aneurysm as the source of the hemorrhage. The following case from my series illustrates the value of angiography in some cases before surgery.

A 42-year-old woman (case 17) gave a past history of mild hypertension and severe right-sided headache for two weeks. On admission the patient was drowsy. The blood pressure was 120/70, and there was homonymous hemianopsia on the left and a weakness of the left side of the face and arm. The spinal fluid was clear and of normal pressure. Roentgenograms showed a shift of the pineal gland 5 mm. to the left; corroborating a space taking lesion in the right temporofrontal area. A craniotomy was done and a large hematoma removed from the right temporal lobe. The wall of the cavity was inspected and found normal. The patient convalesced well; five days later, while sitting in a chair, she suddenly became stuporous. Immediate exploration revealed a rupture of the cortex with a massive hemorrhage into the right temporal and frontal lobe. After removal of a massive clot, a ruptured aneurysm was uncovered near the origin of the right middle cerebral artery. The bleeding was

TABLE 1.—*Differential Diagnosis*

	Intracerebral Hemorrhage	Cerebral Thrombosis
Onset	Sudden	Usually gradual
Headache	Severe and usually on side of hemorrhage	*Absent or mild*
Sensorium	Drowsy to coma	Usually awake
Hypertension	Approximately 50%	Approximately 25%
Eye grounds		
Retina	*May show hemorrhage*	No hemorrhage
Vessels	Hypertensive vascular changes	Atherosclerotic change
Disk	Normal; late choke	Normal
Spinal fluid		
Pressure	*Above normal (90%)*	*Normal (130-160 mm. H_2O)*
Color	*Bloody (75)%*	Normal
Pineal shift *	100%	Absent unless severe *edema is present*

* If gland is calcified.

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7. (*a*) Russell, H. E., and Sargent, P.: Apoplectiform Cerebral Hæmorrhage: *Operation: Evacuation of Blood: Slow Improvement*, Proc. Roy. Soc. Med. **2**: 44, 1909. (b) Bagley, C., Jr.: Spontaneous Cerebral Hemorrhage: Discussion of 4 Types with Surgical Considerations, Arch. Neurol. & Psychiat. **27**: 1133 (May) 1932. (*c*) Penfield, W.: The Operative Treatment of Spontaneous Intracerbral Hæmorrhage, Canad. M. A. J. **28**: 369, 1933. (*d*) Craig, W. M., and Adson, A. W.: Spontaneous Intracerebral Hemorrhage: Etiology and Surgical Treatment, with Report of 9 Cases, Arch. Neurol. & Psychiat. **35**: 701 (April) 1936. (*e*) Furlow, L. T.; Carr, A. D., and Wattenberg, C.: Spontaneous Cerebral Hemorrhage: The Surgical Treatment of Selected Cases, Surgery **9**: 758, 1941. (*f*) Pilcher, C.: Subcortical *Hematoma: Surgical Treatment* with a Report of 8 Cases, Arch. Neurol. & Psychiat. **46**: 416 (Sept.) 1941. (*g*) Hamby, W. B.: Gross Intracerebral Hematomas: Report of 16 Surgically Treated Cases, New York J. Med. **45**: 866, 1945. (*h*) Rowbotham, G. E., and Ogilvie, A. G.: Chronic Intracerebral Hæmatoma: Their Pathology, Diagnosis, and Treatment, Brit. M. J. **1**: 146, 1945. (*i*) Scott, M.: Surgical Treatment of Spontaneous Nontraumatic (Intracerebral) Hematomas of Left Temporal Lobe, J. A. M. A. **130**: 845 (March 30) 1946. (*j*) Robertson, E. G.: Cerebral Lesions Due to Intracranial Aneurisms, Brain **72**: 150, 1949; (*k*) Wechsler, I. S., and Gross, S. W.: Arteriography in Cerebral Vascular Accidents, J. A. M. A. **139**: 502 (Feb. 19) 1949. (*l*) Sirois, J.: Cure chirurgicale des hémorrhagies cérebrales, Laval med. **15**: 457, 1950. (*m*) Grant, F. C., and Austin, G. M.: The Surgical Treatment of Spontaneous and Traumatic Intracerebral Hemorrhage, Am. J. M. Sc. **219**: 237, 1950. (*n*) Ferey, D.: The Surgical Therapy of Spontaneous Cerebral Hemorrhage, Concours méd. **72**: 1235, 1950. (*o*) Lusignan, F. W., and Cross, G. O.: Intracranial Angiography in Treatment of Cerebrovascular Accidents: Reports of Cases and A Review of the Literature, California Med. **73**: 240, 1950. (*p*) Gurdjian, E. S., and Webster, J. E.: Cerebrovascular accidents Arch. Surg. **62**: 724 (May) 1951.

8. Margolis, G.; Odom, G. L.; Bloor, B. M., and Woodhall, B.: The Role of Minute Angiomatous Malformations in the Production of Intracerebral Hematomas, read before the 19th Annual Meeting of the Harvey Cushing Neurosurgical Society, April 26, 1951, Hollywood Beach, Fla.

controlled with cautery and the use of silver clips, and the patient recovered. Follow-up two years later revealed the patient to be ambulatory; she was able to attend movies and social affairs. Her left hand was paralyzed.

If an angiogram had been done in this case, the aneurysm might have been visualized and thus suspected and clipped at the first operation.

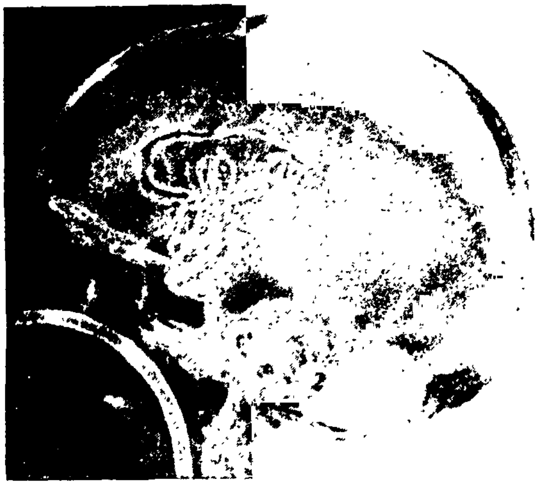

Fig. 2.—Note upward and cephalad displacement of middle cerebral (sylvian artery) due to a large hematoma in the left temporal lobe. Recovery followed removal. (Not included in my series because of a history of possible head trauma.)

The value of cerebral angiography in differentiating intracerebral hemorrhage from thrombosis can be appreciated from the following case.

A 32-year-old woman complained of intractable headaches for three weeks. Examination showed her to be drowsy, with paralysis of the left lower portion of the face and rapid paralysis of the left upper extremity. The blood pressure was 110/60. The spinal fluid showed a pressure of 80 mm. of water and was clear, with normal protein and no cells. The pineal gland was not visualized roentgenographically. Although cerebral thrombosis was suspected, because of the low spinal fluid pressure, the severe and persistent headache together with progressive drowsiness and monoplegia brought up the possibility of a hemorrhage in the right frontal lobe. A right cerebral angiogram showed thrombosis of the right internal carotid artery at a point 2 cm. above the bifurcation (fig. 3).

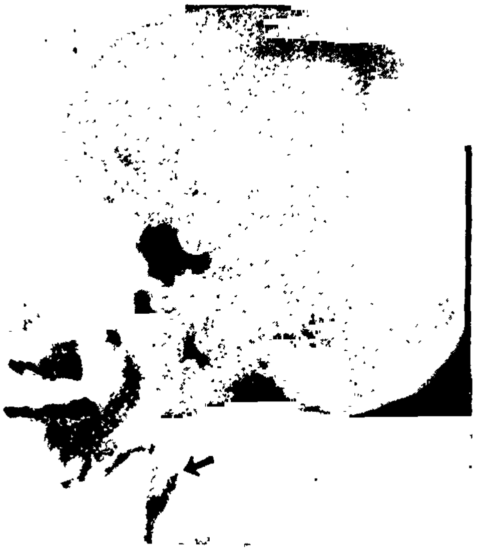

Fig. 3.—Cerebral arteriogram in a case presenting a problem in differentiation between intracerebral hemorrhage and cerebral thrombosis (see text). The arrow points to complete obstruction of the internal carotid artery in the neck, confirming the diagnosis of thrombosis.

In the 105 cases of intracerebral hemorrhage proved at operation, cerebral angiography was done in only nine; in one the hemorrhage was located by the electroencephalogram, and in the majority it was located by the neurological examination. There was no reference in any of the reports to the value of a pineal shift in corroborating a space taking clot.

Although angiography is necessary in some cases, the wisdom of its routine use in spontaneous intracerebral hemorrhage remains to be proved. The knowledge gained must be balanced against the possible reaction to the dye, changes in blood-brain barrier that might lead to increased bleeding or edema, manipulation and trauma to the carotid vessel that might produce spasm or vasodilatation of cerebral vessels, and the loss of valuable time if the patient's condition shows rapid progression. Finally, one must keep in mind that an ordinary roentgenogram of the skull might show a shift of the pineal gland, which would immediately corroborate a diagnosis of hematoma as against cerebral thrombosis or embolism (see section on pineal shift).

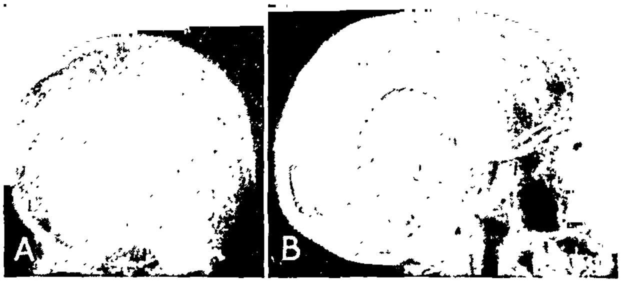

Fig. 4 (case 14).—*A*, anterposterior view. *B*, lateral view. Note enlarged trephine opening, through which the clot was evacuated, and also silver clip on ruptured artery.

I believe that cerebral angiography should be done in these cases (if the patient's condition permits) in the following situations: (1) when the clinical findings suggest aneurysm rather than hypertension, (2) if a calcified pineal gland is not seen in the roentgenograms, (3) if it is impossible to differentiate between thrombosis and hemorrhage and the patient is showing progressive symptoms, and (4) if the lesion cannot be accurately located by the neurological examination.

INDICATIONS FOR SURGERY

Most surgeons agree that operation should not be done unless there is progression in signs and intracranial pressure. One would prefer to operate on hematomas in the nondominant hemisphere, since speech is not endangered. However, there are reports in the literature of patients with motor aphasia who recovered speech after surgery. Occasionally a patient appearing hopeless can be saved.

M. C., a 25-year-old woman (case 14), was admitted in January, 1949, with a history of right-sided headaches for two days followed by sudden left-sided hemiplegia and coma. The patient had a previous history of hypertension. Examination showed decerebrate rigidity, stertorous respirations, and a systolic blood pressure fluctuating between 180 and 230. A spinal puncture revealed bloody fluid under 260 mm. of pressure. Trephining over the right temporofrontal area was promptly done. A large clot was found and removed from the temporofrontal lobe, and the middle cerebral artery could be seen spurting in the cavity. A silver clip was applied. Follow-up over two years showed an ambulatory patient doing light housework. She was able to get about with a leg brace and cane but the left hand was useless. Her blood pressure was 140/90.

Indications for surgical intervention are outlined as follows:

1. Symptoms and signs of progressive increase in intracranial pressure:

   (*a*) Loss of conscious levels to stupor or coma

   (*b*) Snoring or sterterous respirations

   (*c*) Progressive slowing of pulse rate (below 60) and respirations below 16

   (*d*) Increased spinal fluid pressure (above 160 mm. of water)

   (*e*) Choked disk if symptoms persist for days

2. Objective neurological signs of focal involvement of the brain:

   (*a*) Aphasia (sensory or motor)

   (*b*) Visual field cut

   (*c*) Hemiplegia or hemianesthesia

   (*d*) Fixed dilated pupil on one side

   (*e*) Unilateral convulsions

3. Shift of the pineal gland away from the suspected cerebral hemisphere seen roentgenographically

4. Positive arteriogram showing space-taking clot or ruptured aneurysm

TABLE 2.—*Analysis of Clinical and Laboratory Data in Twenty-Three*

Case No.	Age, Yr.	Sex	Duration of Symptoms	Headache †	Sensorium	Blood Pressure	Abnormal Neurological Signs
1	53	M	24 hr.	+	Drowsy	206/96	Aphasia; right hemianopsia
2	66	M	1 hr.	..	Comatose	210/104	Left hemiplegia
3	40	F	24 hr.	+	Drowsy	140/180	Aphasia; right hemiparesis
4	37	M	12 hr.	+	Drowsy	130/80	Aphasia; right hemiparesis
5	38	F	2 weeks	..	Drowsy	140/88	Choked disk; aphasia; right hemiplegia
6	60	M	?	+	Aphasic	140/99	Right hemiplegia
7	56	M	3 days	..	Drowsy	180/90	Aphasia; right hemiplegia
8	58	M	24 hr.	..	Clear	218/150	Left hemiplegia
9	47	F	4 days	+	Clear	138/78	Left homonymous hemianopsia
10	66	M	2 weeks	+	Comatose	160/80	Decerebrate rigidity
11	51	F	7 days	+	Stuporous	148/70	Left hemiparesis
12	60	M	10 days	+	Drowsy	210/140	Left hemiparesis
13	46	F	2 days	..	Stuporous	230/120	Left hemiparesis
14	25	F	2 days	+	Comatose	180/100	Decerebrate rigidity
15	26	M	2 days	+	Comatose	136/60	Decerebrate rigidity
16	50	F	24 hr.	..	Drowsy	210/110	Left hemiplegia
17	42	F	2 weeks	+	Drowsy	120/70	Left hemianopsia and hemiparesis
18	70	M	24 hr.	+	Drowsy	160/90	Left astereognosis and hemianopsia
19	53	M	2 hr.	+	Comatose	230/160	Right hemiplegia
20	40	M	2 hr.	..	Drowsy	130/90	Motor aphasia; right hemiplegia
21	57	M	48 hr.	+	Stuporous	200/110	Left hemiplegia
22	58	M	2 hr.	+	Stuporous	210/130	Left hemiplegia
23	49	F	7 days	+	Stuporous	152/100	Right hemiplegia

* Blood cell counts and urinalyses were done routinely but were not of diagnostic significance. Blood Wassermann reaction was negative in all 18

† +, present. ‡ N. C., *gland not calcified.* § L. C., left craniotomy; R. T., right trephining; L. T., left trephining; R. C., right craniotomy.

ANALYSIS OF CASES IN RECENT SERIES

This report deals with 23 consecutive patients operated on by me for spontaneous nontraumatic intracranial hemorrhage (table 2). Three cases reported previously,[71] in 1946, are included in this presentation. Eighteen patients had hemorrhages into the various lobes of the cerebrum. Three had hemorrhages into the subdural space. Two had massive hemorrhages into a highly vascular tumor. There were 14 men and 9 women; one patient was a Negro. The youngest patient was 25 years of age and the oldest 70. Seventy-five per cent of the patients were between 40 and 66 years of age. Twelve (52%) had a history of hypertension before onset of the cerebral accident, and in all 12 the systolic blood pressure at the time of admission was above 180. In 10 patients the systolic pressure was between 120 and 150, in four between 160 and 200, and in nine between 200 and 230.

Headache.—Headache was present in 18, or 78%. It was bilateral in eight and localized in either side in equal numbers in 10. In all 10 the side of the headache corresponded to the side of the cerebral hemorrhage.

Nuchal Rigidity.—Nuchal rigidity was found in seven patients (all with bloody spinal fluid). It was absent in seven (three of whom had blood-tinged fluid) and not tested for in the remaining nine. It was present, therefore, in 50% of the cases in which the test was made.

Pupillary Changes.—The pupils were equal in size in 18 cases and unequal in four. In the latter group the larger pupil did not correspond to the side of the cerebral hemorrhage in two cases.

Eye Grounds.—Eye grounds were normal in eight cases; hypertensive arteriosclerotic changes were noted in eight. Choked disk was present in only two cases, in one case three weeks after onset of hemorrhage; in the other a hemorrhage into a tumor was found.

Cases of Surgically Treated Spontaneous Intracerebral Hemorrhage

Spinal Fluid						
Color	Pressure, Mm.	Pineal Gland ‡	Type of Operation §	Location of Hematoma	Cause	Follow-Up
Clear	130	Shift	L. C.	Left temporal lobe	?	4 yr.; working; residual right hemianopsia
Pink	290	……	R. T.	Right internal capsule	?	Died 11 days postoperatively; no autopsy
Yellow	380	N. C.	L. C.	Left temporal lobe	?	Discharged improved; no follow-up
Pink	300	Shift	L. C.	Left temporal lobe	?	7 yr.; recovered; residual right quadrantanopsia
Clear	480	……	L. C.	Left frontal lobe	Tumor	Died 15 days postoperatively; metastatic chorioepithelioma
…..	180	……	L. T.	Left subdural space	?	Died 20 days postoperatively of epidural hemorrhage
Pink	175	Shift	L. C.	Left internal capsule	?	Died 7 days postoperatively; necrosis of kidney; brain hemorrhage
…..	…	Shift	R. C.	Right internal capsule	?	4 yr.; no improvement; invalid
Pink	220	Shift	R. C.	Right temporal lobe	?	3 yr.; working; residual left homonymous hemianopsia
Pink	260	……	L. C.	Left subdural space	Ruptured artery	3 yr.; slight residual anomia; ambulatory
Red	270	N. C.	R. C.	Right subdural space	?	3 yr.; recovered; slight improvement in vision of left eye
Clear	215	N. C.	R. T.	Right frontal lobe	?	3 yr.; recurrent attack; slight improvement
Pink	300	N. C.	R. C.	Right internal capsule	Ruptured artery	Died 4 days postoperatively; meningitis; no autopsy
Pink	260	……	R. C.	Right temporal and frontal lobes	Lesion, middle cerebral artery	2 yr.; ambulatory
Pink	440	……	R. T.	Right frontal lobe	Tumor	Died 3 mo. after reoperation for metastatic melanoma
Pink	300	N. C.	R. T.	Right frontal lobe	?	Died 2 yr. later in another hospital of recurrent hemorrhage
Clear	160	Shift	R. C.	Right temporal lobe	Aneurysm in circle of Willis	2 yr.; ambulatory
…..	…	Shift	R. C.	Right temporal lobe	Cardiac; embolic	7 mo.; recovered, then died of a coronary attack
Red	230	N. C.	L. C.	Left internal capsule	?	Died 3 days postoperatively; no autopsy
Clear	180	N. C.	L. T.	Left frontal lobe	?	1 yr.; still aphasic; leg improved
Pink	400	N. C.	R. T.	Right internal capsule	?	6 mo.; recovery; left lower extremity
Red	250	N. C.	R. T.	Right internal capsule and ventricle	?	5 mo.; no improvement
Red	?	……	L. T.	Left internal capsule	?	Died 3 days postoperatively of edema and hemorrhage

patients tested. Bleeding and coagulation times were normal in all 17 patients tested.

State of Sensorium on Admission.—Three patients were alert, 11 were drowsy, 4 were in stupor, and 5 were comatose on admission. Four of the eight deaths in the entire group occurred in those cases in which stupor or coma was present.

Abnormal Neurological Signs.—All 23 patients had neurological signs that permitted location of the cerebral hemisphere involved. These signs varied from a dilated pupil to complete hemiplegia. Seventeen patients had paralysis of one side of the body (nine on the right and eight on the left). Five of these had an associated motor aphasia, two had a mixed aphasia, and two had an associated reduction in the visual field. Three patients had decerebrate rigidity. One patient had a homonymous field defect only, another a mixed aphasia with homonymous cut, and another had astereognosis with homonymous field defect (table 3).

Laboratory Studies.—A complete blood cell count and urinalysis were done in all cases. The reports were not unusual. The bleeding and clotting times were determined in 17 cases and found normal in all. The prothrombin time was determined in 11 cases; it was 30% to 35% in two cases, 50% in five, 60% in one, 70% in one, and 80% in one. The thrombocyte count was determined in 14 cases; it was below 200,000 in three. The blood Wassermann reaction was negative in all 18 cases in which the test was made.

Spinal Fluid: The spinal fluid pressure was recorded in 20 cases. It was above normal (160 mm. of water) in 18 (90%). The two highest pressures, 480 mm. and 440 mm., were found in the two cases of brain tumor associated with hemorrhage. The average pressure, excluding the cases of brain tumor, was 238 mm. of water. The spinal fluid was examined for red cells in 19 cases. It was reported to be clear in 5 cases, pink in 10, and cherry red in 4. Thus, the spinal fluid was bloody in 14 out of 19 cases (73%).

The Wassermann reaction of the spinal fluid was negative in the nine cases in which the test was made.

Pineal Shift.—Roentgenograms of the skull were taken before operation in 16 cases. In eight (50%) the pineal gland was not calcified. In the remaining eight (50%), it was calcified and a definite pineal shift was found, which permitted location of the side of the intracerebral hemorrhage. Thus, in 100% of cases in which the pineal gland was visualized, a definite diagnosis of the presence any location of a space taking mass could be made.

Type of Operation.—An exploratory craniotomy was done in 14 cases and an enlarged trephine opening made in nine. Reexploration was done in two cases of brain tumor, in case 6 three days after the original operation and in case 15 three months after the original operation. Death occurred in both cases, and autopsy showed extensive metastasis. Reexplorations were done in five of the remaining 21 cases (cases 9, 14, 16, 17, and 21). In case 9 another operation was performed one and a half years later, because of a tight decompression and headaches. A porencephalous dilatation of the ventricle in the region of the previous clot cavity was found, with no recurrence of the clot. Examination made one year later revealed that the patient was comfortable and was working; the only residual sign was left homonymous hemianopsia (fig. 6).

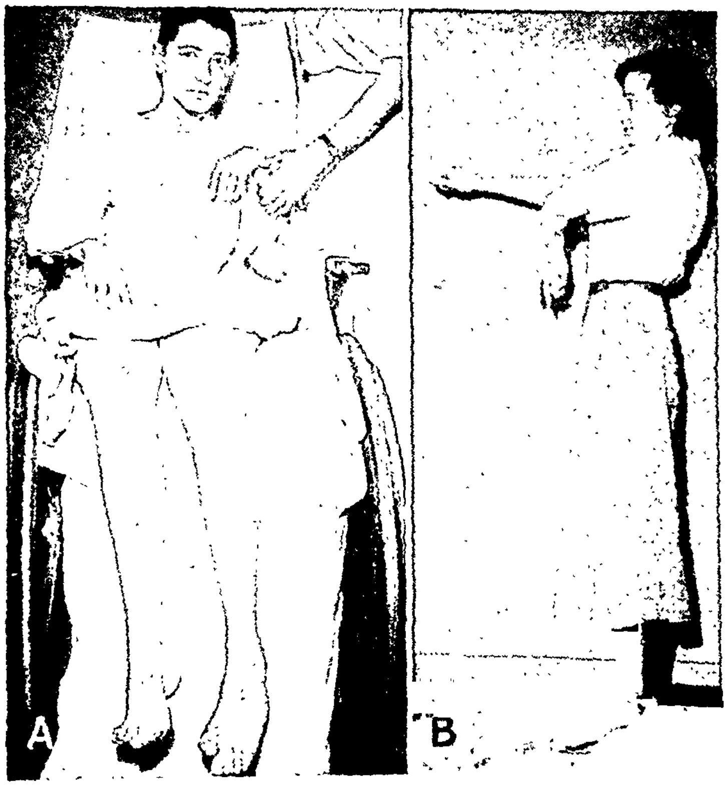

Fig. 5 (case 14).—*A*, six weeks after operation. *B*, two years after operation (see text).

One patient (case 4) was reoperated on six days after the first operation, and a small amount of old liquid blood was drained from the subdural space. This patient recovered and is walking with a brace and cane. One patient (case 16) was operated on three times. At the first operation liquid blood was evacuated from the right internal capsule. At the second operation, 11 days later, a solid clot was evacuated and a subtemporal decompression was done. Two weeks later, the incision was reopened but no recurrence was found. There was no improvement in the paralysis. The patient died two years later from a recurrent hemorrhage.

Case 17 suggests the importance of preoperative arteriography (see differential diagnosis). In case 21, reoperation 18 hours after the first operation was done because of recurring stupor. A bleeding artery from the inner scalp layer was found. There was no recurrent clot within the tumor cavity. The patient's paralysis is improving.

Gross Findings at Operation.—Liquid blood was aspirated in four cases; solid large hematomas were found in the remaining 19 (including two cases of tumor). In five cases involving the temporal lobe, the clot cavity encroached on the almost paper-thin lateral wall of the ventricle. The right hemisphere was involved in 13 cases and the left in 10 cases.

TABLE 3.—*Summary of Clinical Findings in Twenty-Three Cases of Spontaneous Intracranial Hemorrhage*

Clinical Findings		No. of Cases	%
Hypertension		12	52
Headache		18	78
Bilateral	*8*		
Unilateral	10 (R, 5; L, 5)		
Sensorium			
Awake		3	13
Drowsy		11	48
Stuporous or comatose		9	39
Pupils *equal*		18	78
Pupils unequal		4	17
Choked disk		2	9
Visual field defect		4	17
Motor aphasia		4	17
Mixed aphasia		3	13
Hemiparesis		5	22
Hemiplegia		12	52
Decerebrate *rigidity*		3	13
Blood Wassermann *neg*		18	100
Spinal fluid			
Pressure elevated		18	90
Red cells		14	73
Wasser*mann neg*		9	100 *
Calcified pineal		8	..
Pineal shift		8	100 †

* The Wassermann reaction was negative in 100% of the cases in which the test was made.

† X-rays were made in 16 cases, and pineal shift was present in 100% of cases in which the gland was visualized.

TABLE 4.—*Portion of Brain Involved*

		No. of *Cases*
Frontal lobe		13
Left frontal	4 (4 in internal capsule)	
Right frontal	9 (5 in internal capsule)	
Temporal lobe		6
Left temporal	3	
Right *temporal*	3	
Right temporofrontal		1
Subdural space		3
Left subdural	2	
Right subdural	1	
Total		23

Microscopic Examination of Blood Clot and Wall of Cavity.—A biopsy of the hematoma and cavity wall was made in 22 of the 23 cases. In two cases (5 and 15), chorioepithelioma and malignant melanoma were reported as the source of the hemorrhage. In the remaining cases the diagnosis was blood clot with or without inflammatory cells; in a few, arteriosclerotic as well as endarteritic changes were reported. It was the pathologist's impression that the inflammatory changes were the result of the hemorrhage, and not the cause of it.

Causes of Hemorrhage.—The hematoma was caused by a rupture of an artery with no visible aneurysm in three cases. An aneurysm of the right middle cerebral artery was found in one case. A brain tumor was the cause in two cases (chorioepithelioma and malignant melanoma). No obvious cause for the hemorrhage was found at operation in the remaining 17 cases.

Mortality.—Eight patients died in the hospital after operation. The mortality following operation was 35% for the entire group. The mortality drops to 28% if the two cases of brain tumor are excluded. It should be noted that all the patients with intracerebral hematoma except three (case 6 and the two cases of tumor) who died after operation were stuporous or comatose or had elevated blood pressure when admitted.

Follow-up.—Fifteen patients recovered from their acute episode and were discharged from the hospital (table 2). Five patients are working, four regularly and one part time. Five patients show no marked improvement in paralysis and are invalids. Two patients are ambulatory, do light housework, and attend movies and social functions. The involved hand in each case is useless. Two patients died (one from another attack two and a half years later and the other from coronary artery thrombosis seven months later). One patient could not be located.

SUMMARY

Twenty-three consecutive cases of surgically treated spontaneous nontraumatic intracranial hemorrhage are reported. The hemorrhage occurred into various lobes of the brain in 20 cases and into the subdural space in three. The hemorrhages occurred in the internal capsule in nine cases. The youngest patient was 25 years of age and the oldest 70. Seventy-five per cent were between 40 and 66 years of age. Twelve (52% had a history of hypertension before onset of cerebral accident. Headache occurred in 78%. It always corresponded to the side of cerebral hemorrhage when unilateral. Nuchal rigidity was present in 50%. Only three patients were alert on admission; 11 were drowsy; nine were in stupor or coma. All patients had neurological signs that permitted accurate location in the involved cerebral hemispheres.

Routine blood cell count, urinalysis, Wassermann reaction, bleeding and clotting times, prothrombin time, and thrombocyte count gave no clue as to the cause.

The spinal fluid pressure was above normal in 90% of the cases; the fluid was blood-tinged or red in 73%. In 100% of the cases in which the pineal gland was visualized by roentgenograms (eight cases), it was displaced and permitted a definite diagnosis of the presence and location of a space taking clot (due to tumor in two cases). Air studies or angiograms were not necessary for location in this series.

An exploratory craniotomy was done in 14 cases and a large trephine opening made in nine. Reexplorations were done for various reasons in 7 of the 23 cases. Liquid clot was found in four cases; solid clots were found in remaining 19 (including two cases of brain tumor). Portions of the brain were involved in the following frequency: frontal, 13 (9, internal capsule); temporal, 6; right temporofrontal, 1; and subdural space, 3. Biopsy of hematoma and cavity wall or membrane was made in 22 of 23 cases. An aneurysm was found in one case; rupture of an artery with no visable aneurysm was found in 3; brain tumor was found in two; no obvious cause for hemorrhage was found in the remaining 17 cases. Eight patients died in the hospital after operation (mortality 35%; if two cases of brain tumor are excluded the mortality is 28%). Fifteen patients recovered from the acute episode and were discharged from the hospital.

CONCLUSIONS

1. Spontaneous intracerebral hemorrhage produces symptoms and signs of a focal expanding lesion and is associated in the majority of cases with bloody spinal fluid under increased pressure.

2. This condition must be differentiated from cerebral thrombosis or embolism, because the treatment of the latter with stellate block or anticoagulants might prove disastrous if used in the treatment of cerebral hemorrhage.

Fig. 6 (case 9).—Three years after removal of a hematoma from the right temporal lobe, the patient was working regularly. She had residual left homonymous hemianopsia.

3. Any person, regardless of age, experiencing sudden headache associated with focal signs such as aphasia, visual field defect, anesthesia, or hemiplegia and progressive drowiness or stupor should be considered to have a space taking lesion, possibly intracerebral hematoma.

4. The following steps should be taken promptly: (*a*) careful history and neurological examination, (*b*) examination of the eye grounds, (*c*) careful spinal puncture to determine pressure and slow removal of 3 cc. of fluid in a search for evidence of bleeding, and (*d*) steroscopic x-rays of skull for determination of pineal shift.

5. Cerebral angiography is not essential as a routine procedure, and its use is not without risk. The diagnosis

and location of the clot was established in every case in this series without it. Valuable time may be lost and operation unduly delayed. I believe that it should be used in the following circumstances if the patient's condition is not critical: (*a*) when the clinical findings suggest aneurysm rather than hypertension as a factor, (*b*) if the lesion cannot be accurately located by the neurological examination, (*c*) if a calcified pineal gland is not seen on plain roentgenograms of the skull, and (*d*) if it is impossible to differentiate between thrombosis and hemorrhage and the patient is showing progression in symptoms.

6. Although occasionally patients with intracerebral hemorrhage recover spontaneously, the majority show progression in focal signs and increased intracranial pressure. Prompt diagnosis and surgical intervention in this group will save lives.

ADDENDUM

Since this paper was written, seven additional patients have been operated on (one by my associate, Dr. Frederick Murtagh). Four of the lesions were in the internal capsule; two were in the temporofrontal lobe; and one was in the left parietal lobe. There were two postoperative deaths. Five patients recovered after surgery, two with excellent function, one with residual hemiplegia, and one with persistent decerebrate rigidity. One patient was recovering satisfactorily but died suddenly four months later from another hemorrhage.

225 S. 17th St.

CLINICAL NOTES

MACROGLOSSIA AS A MANIFESTATION OF PRIMARY SYSTEMIC AMYLOIDOSIS

REPORT OF A CASE

William G. Ensign, M.D., Minot, N. D.

Macroglossia is an unusual and striking clinical finding. The number of listed causes is relatively few, and the diseases associated with it are for the most part infrequently encountered. Among the listed causes are primary systemic amyloidosis, myxedema, acromegaly, glycogenosis (von Gierke's disease of muscle),[1] advanced tertiary syphilis, and congenital anomaly.[2] The congenital type of macroglossia is further divided into two types, lymphangiomatous and muscular. Most authors, in describing amyloidosis, have followed the classification of Reimann, Koucky, and Eklund.[3] They have divided amyloidosis into four clinicopathological groups: (1) primary amyloidosis, (2) secondary amyloidosis, (3) tumor forming amyloidosis, and (4) amyloidosis associated with multiple myeloma.

Secondary amyloidosis, which is associated with various chronic diseases, is relatively common and well known, whereas primary amyloidosis is rare. Up to 1950 there had been reported in the literature approximately 70 cases. Primary amyloidosis is characterized by (1) absence of preceding disease; (2) no involvement of organs or tissues usually affected in the secondary form, such as the liver and spleen; (3) involvement of mesodermal tissue, the cardiovascular system, the gastrointestinal tract, smooth and striated muscle, and lymph nodes; (4) variation in staining reactions; and (5) a tendency to nodular deposits.[3] The tumor forming type is very similar to the primary form. The primary form has appeared only during the later decades of life, and its sex distribution is about equal. The genesis of this disease is unknown, and there is no known treatment.

A correct clinical diagnosis of primary systemic amyloidosis is seldom made. According to Ballinger,[4] of the 46 cases in which postmortem examination was made and which were reported in the literature, in only 8 was the diagnosis made clinically. The appearance of macroglossia is one of the few manifestations on the basis of which a clinical diagnosis can be made. Diagnosis has also been made by biopsy of skin, mucous membrane, and muscle. In the case reported herein, the presenting symptom was a painless, diffuse, symmetrical enlargement of the tongue. A clinical diagnosis of primary systemic amyloidosis was made on this basis and later proved at autopsy.

REPORT OF A CASE

H. L., a 72-year-old retired farmer, was first seen on April 27, 1951, complaining of a "big tongue," which he had first noticed approximately one year previously. The right arm had been amputated in a sawmill accident when the patient was in his early twenties. In 1938, a right inguinal herniorrhaphy was performed.

The enlargement of the tongue was not accompanied by pain, foul breath or taste, burning, or change in salivation. During the few months before examination, the enlargement had progressed to a point where speech became difficult, and the patient was unable to keep his dentures in position. He also complained of bilateral deafness, of many years' duration, which had become progressively worse in the four days prior to examination. For the previous five to six years, he had had intermittent, dull, generalized pain in the left wrist and hand. On a few occasions during the preceding year, he had noted small amounts of fresh blood with bowel movements.

Physical examination revealed a well-developed, well-nourished, old man who did not appear to be ill or in distress. His speech was slow, and most words were poorly enunciated. The temperature was 99 F, pulse rate 84, and respirations 20. The blood pressure was 192 systolic and 100 diastolic. The skin was clear throughout. The eyes, nose, neck, and lymph nodes were normal. There was a large amount of impacted cerumen in both external ear canals. The patient was completely edentulous. There was a symmetrical enlargement of the entire tongue to approximately double an average-sized tongue. Although the tongue was pale, there were no gross changes of the mucous membrane. All tongue motions were present but were performed with difficulty. The lungs were clear to auscultation and percussion. The heart was normal to palpation. The left border of cardiac dulness was 10.0 cm. from the midline in the fifth intercostal space. The rhythm was regular, and the sounds were

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From the Department of Medicine, Northwest Clinic.

[1] Clement, D. H., and Godman, G. C.: Glycogen Disease Resembling Mongolism, Cretinism, and Amyotonia Congenita: Case Report and Review of Literature, J. Pediat. **36**: 11-30, 1950.

[2] Bell, H. G., and Millar, R. G.: Congenital Macroglossia: Report of 2 Cases, Surgery **24**: 125-133, 1948.

[3] Reimann, H. A.; Koucky, R. F., and Eklund, C. M.: Primary Amyloidosis Limited to Tissue of Mesodermal Origin, Am. J. Path. **11**: 977-988, 1935.

[4] Ballinger, J.: Amyloid Heart Disease, Am. J. M. Sc. **217**: 308-313, 1949.

of good quality. There was no gallop or friction rub. There were no murmurs. Palpation revealed a moderate amount of arteriosclerosis in the peripheral arteries. There was no peripheral edema. Aside from a right inguinal surgical scar, the abdomen was normal. Rectal examination disclosed nothing unusual. The prostate was essentially normal. Examination of the extremities showed an amputation of the right arm above the elbow and a moderate amount of hypertrophic changes of all finger joints of the left hand. The deep reflexes were active and equal throughout.

The red blood cell count was 3,600,000, hemoglobin 76%, and the white blood cell count 8,300, with 68% neutrophils, 25% lymphocytes, 6% eosinophils, and 1% basophils. The serologic reaction of the blood was negative. Urinalysis showed a specific gravity of 1.015, pH of 5.0, 60 mg. of albumin per 100 cc., no sugar, 0 to 1 white blood cell, 10 to 15 red blood cells, and a rare coarsely granular cast. The coagulation time was 4 minutes 10 seconds. A congo red test was performed intravenously, which revealed 83% of the injected dye remaining in the plasma after one hour. An electrocardiograph showed sinus rhythm, left axis deviation, and a deep Q wave in lead AVF, which suggested posterior myocardial damage. An x-ray of the chest showed thickened pleura at the base of the right lung. An x-ray of the left hand revealed a moderate amount of degenerative arthritis of the interphalangeal joints. Basal metabolic rates were reported as +26% and +34%. The accuracy of these basal metabolic rates was in doubt, as the mouth piece could not easily be maintained in proper position. An audiogram revealed evidence of bilateral nerve deafness.

The patient was hospitalized. On his fifth hospital day the margins of the tongue were resected for relief of his symptoms and for biopsy. The incision was closed with 14 interrupted black silk sutures. The patient suddenly became cyanotic at the completion of the operation and died shortly thereafter.

Autopsy.—A postmortem examination was made three hours after death by Dr. Paul J. Breslich. There was slight pitting edema of the lower extremities. Examination of the abdominal cavity revealed loops of small and large intestine moderately distended with gas. The appendix vermiformis was normal. There was moderate enlargement of the spleen. The inferior margin of the liver was 6 cm. below the xiphoid process of the sternum in the midline, and the superior margin was 6 cm. above the costal margin in the right anterior axillary line.

Both lungs were hugely distended with air. The lower third of the right pleural cavity was obliterated by dense fibrous adhesions. The right lung weighed 1,000 gm. and the left 820 gm. On section, the lung parenchyma contained a large amount of frothy, blood-stained fluid. No gross changes were noted in the veins of the thorax, thoracic duct, trachea, main bronchi, or large pulmonary vessels.

The heart weighed 450 gm. The transverse diameter of the heart measured along the upper surface of the diaphragm was 15 cm. The endocardium of the right auricle, right auricular appendage, and right ventricle showed no changes. The tricuspid and pulmonic valve leaflets were unchanged. The endocardium of the left auricle was markedly thickened by fibrous scar. There was a moderate amount of scar tissue on the posterior wall of the left ventricle and a rather large amount in the ventricular septum. There was no noteworthy change of the mitral or aortic valves.

The myocardium was studded extensively with slightly elevated, white nodules, resembling the cut ends of thickened blood vessels. These nodules measured 0.5 to 2 mm. in diameter. The coronary artery orifices were widely patent. The lining of the anterior descending branch of the left coronary artery was extensively mottled with atheromatous plaques, while relatively few were observed in the circumflex branch and in the right coronary artery.

The right and left kidneys weighed 100 and 130 gm., respectively. There were numerous wedge-like depressed scars on the surfaces. The cortical markings were irregular and indistinct. The liver weighed 1,700 gm. and the spleen 300 gm. There were no gross changes observed in these organs. There were no noteworthy changes in the biliary, pancreatic, or genitourinary systems, adrenals, thyroid, parathyroid, diaphragm, esophagus, stomach, or small and large intestine. The ribs and vertebrae showed no changes.

Fresh tissue sections of the tongue and myocardium were stained with an iodine-sulfuric acid preparation. This showed an extensive brown staining reaction characteristic of amyloid.

Microscopic Examination.—Histological sections were stained with hematoxylin and eosin. In all tissues examined there was marked thickening of the walls of the small arteries by scar tissue; this was frequently most pronounced in the intima, but very often the entire vessel wall was thickened, and the normal differentiation of intima, media, and externa was no longer apparent. Scattered throughout the thickened arterial walls were masses of red hyaline material, which gave the characteristic staining reaction of amyloid. In some of the larger arteries the amyloid was deposited in greatest abundance at the junction of the thickened intima with the media. In others the distribution was more diffuse in the media and adventitia.

In microscopic sections from the tongue (fig. 1 and 2), there were huge masses of thick-walled arteries, sometimes occupying 75% of the microscopic field. Amyloid was found in great abundance in these arteries. The muscle fibers of the tongue also contained amyloid, and it was occasionally possible to demonstrate that a normal muscle fiber became continuous with one containing amyloid. In the deeper portions of the tongue, there were huge scars containing waxy, red amyloid.

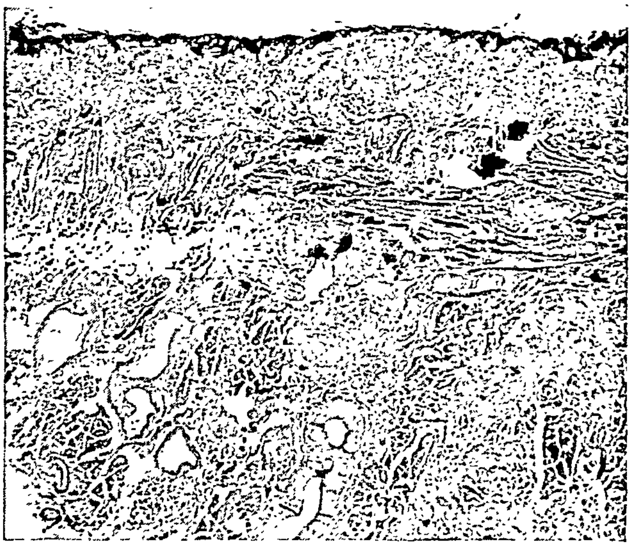

Fig. 1.—Tongue. Masses of amyloid are deposited beneath the epithelial surface and in the muscle bundles. The vessel walls are thickened by amyloid. (Hematoxylin and eosin stain × 25.)

Microscopic examination of the heart showed that the muscle fibers were of increased diameter and contained scattered masses of amyloid substance. The small arteries in the myocardium were everywhere thickened by scar containing amyloid. The lumens of these blood vessels were markedly reduced, so that the diameter of the lumen was frequently less than one-sixth of the thickness of the wall. The fibrous tissue between the heart muscle fibers was everywhere increased.

The alveoli of the lungs for the most part were filled with a pink, hyaline precipitate. Many of them contained masses of red blood cells. Occasional alveoli contained exudates of large mononuclear cells, whose cytoplasm was packed with the granular yellow pigment of changed blood. The small arteries in the sections presented the same amyloid and fibrotic changes seen in other tissues.

Sections of the spleen, kidney, liver, adrenals, thyroid, gastrointestinal tract, and prostate all showed the blood vessel changes noted in the tongue, myocardium, and lung. The final pathological diagnosis was primary systemic amyloidosis with involvement of the heart, tongue, and the vascular systems of the lungs, liver, spleen, kidneys, adrenals, thyroid, prostate, and gastrointestinal tract, along with pulmonary emphysema and acute congestive heart failure with pulmonary edema.

COMMENT

The importance of macroglossia as seen in primary systemic amyloidosis differs with various authors. Koletsky and Strecher [5] stated that one of the most constant findings in this disease is enlargement of the tongue. In their review of the literature up to 1938, they found the tongue the seat of amyloid deposits in 20 of the 24 cases reported. In 1945 Lindsay and Knorp [6] reviewed 15 cases in addition to those tabulated by Koletsky and Stretcher and added one of their own. Of these 16 cases, in only one was amyloid described in the tongue. Dahlin,[7] in reporting six cases from the Mayo Clinic in 1949, found macroglossia from amyloid disease in only one of six. In his review of the literature he found macroglossia in less than one-third of the cases and flatly stated that this diagnostic sign was over rated. Whether amyloid macroglossia appears frequently or infrequently, it still remains as one of the few bases on which a clinical diagnosis can be made. This is well illustrated in the case reported here, as the only evidence of a serious and extensive underlying disease was macroglossia.

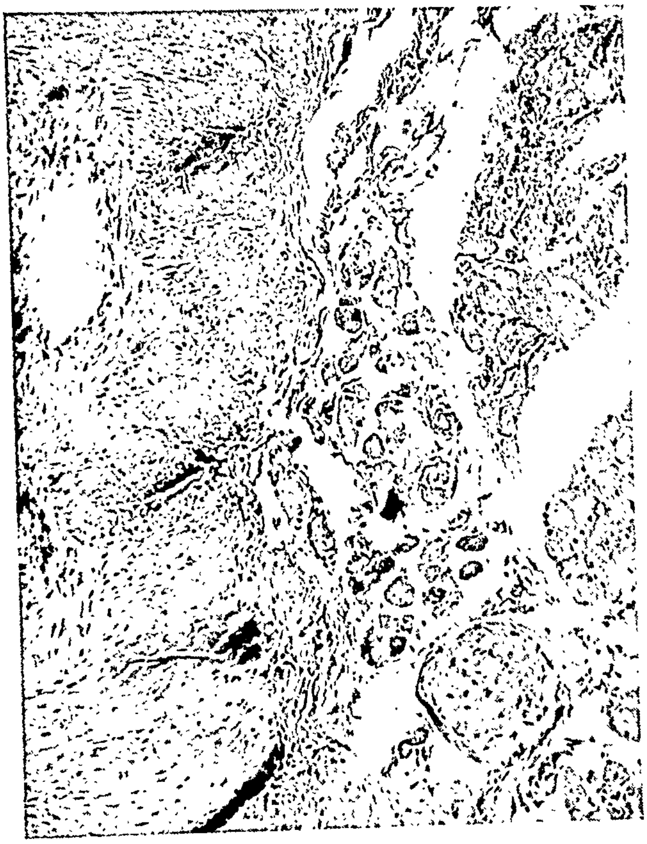

Fig. 2.—Tongue. Vessel walls are thickened by amyloid deposits. There is considerable luminal narrowing. (Hematoxylin and eosin stain × 175.)

The only other avenues to a clinical diagnosis have been biopsies of the skin, mucous membranes, and muscle. The intravenous congo red test has occasionally been an aid, but only when the reaction was positive. Both positive [8] and negative [9] results have been reported. In the case reported here, the reaction was negative.

Up to 1949, according to Dahlin,[7] there were 54 cases of true primary systemic amyloidosis reported in the literature. Among these, there was cardiac amyloid infiltration in 46; in 25 of these myocardial insufficiency was considered the cause of death. The gastrointestinal tract was involved in 33 cases. In five of these there was serious hemorrhage from the gastrointestinal tract. Amyloid of the tongue was reported in 26 cases. Involvement of the lungs was noted in 24 cases, of the skeletal muscle in 19 cases, and of the skin in approximately one-fourth of the cases. He noted that in 21 cases the liver and kidneys were involved and in 20 cases the spleen was involved. Other reported sites of involvement are the lips, buccal mucosa, pharynx, larynx, esophagus, trachea, bladder, anus, dura mater, sympathetic ganglion, peripheral nerves, bone, tendon, joints, bone marrow, and practically the entire genital tract, in both sexes. There have been no reports of deposits within the brain.

Amyloid infiltration of the heart is by far the commonest lesion and is usually the direct cause of death. Among the 48 cases of primary systemic amyloidosis studied by Eisen,[10] there was evidence of congestive heart failure in 26, or 54%. According to Ballinger,[11] the clinical picture of amyloid heart disease is that of intractable congestive failure of unknown cause. There is usually cardiac enlargement but no evidence of valvular disease, hypertension, or coronary sclerosis. The electrocardiograms usually indicate myocardial damage, but it is of a nonspecific nature. There are usually altered T wave patterns, prolonged P-R intervals, and low voltage complexes. He concludes that the most characteristic clinical feature is rapidly progressing, intractable congestive failure.

SUMMARY

A case of primary systemic amyloidosis is reported. Clinically the patient presented only a painless, diffuse, symmetrical enlargement of the tongue. The result of an intravenous congo red test was normal. Shortly after surgical resection of the tongue had been completed, the patient suddenly died. Postmortem examination revealed extensive amyloid deposits in the tongue and myocardium. There was widespread involvement of small blood vessels throughout nearly all the other organ systems.

20 Fourth Ave., S. W.

5. Koletsky, S., and Strecher, R. M.: Primary Systemic Amyloidosis: Involvement of Cardiac Valves, Joints and Bones, with Pathologic Fracture of the Femur, Arch. Path. **27**: 267-288 (Feb.) 1939.

6. Lindsay, S., and Knorp, W. F.: Primary Systemic Amyloidosis, Arch. Path. **39**: 315-322 (May) 1945.

7. Dahlin, D. C.: Primary Amyloidosis, with Report of 6 Cases, Am. J. Path. **25**: 105-123, 1949.

8. Michelson, H. E., and Lynch, F. W.: Systematized Amyloidosis of 1934. the Skin and Muscles, Arch. Dermat. & Syph. **29**: 805-820 (June) Gerber, I. E.: Amyloidosis of the Bone Marrow, Arch. Path. **17**: 620-630 (May) 1934.

9. Reimann, Koucky, and Eklund[3] Golden, A.: Primary Systemic Amyloidosis of the Alimentary Tract, Arch. Int. Med. **75**: 413-416 (June) 1945.

10. Eisen, H. N.: Primary Systemic Amyloidosis, Am. J. Med. **1**: 144-160, 1946.

11. Ballinger, J.: Amyloid Heart Disease, Am. J. M. Sc. **217**: 308-313, 1949.

Preventive Geriatric Medicine.—The most significant potentialities of geriatric medicine lie in the area of preventive or anticipatory therapy during the years of senescence. Any dysfunction which tends to accentuate or accelerate depreciation may be detected early; to wait for obvious symptoms and signs is to wait too long. Maximum benefit derives from constant alert search for early subtle changes whose consequences may not become obvious for many years. One of these is mild hypothyroidism, which presents significant potentialities in inducing cumulative harm through hypercholesterolemia, myocardial damage, anemia and intellectual retrogression. Our observations lead us to the conviction that a basal metabolic rate determination should be routine in health inventories after 40, when applied to apparently well people. This is part of anticipatory medicine, or preventive geriatric medicine.—Seruch T. Kimble, M.D., and Edward J. Stieglitz, M.D., Hypothyroidism: A Geriatric Problem, *Geriatrics*, January-February, 1952.

USE OF FUNCTIONAL DEVICES FOR DISABILITIES OF THE UPPER EXTREMITY

REPORT OF A CASE

Lieutenant Colonel Charles D. Shields, M.C., U.S.A., Fort Sam Houston, Texas
and
Colonel E. M. Smith, M.C., U.S.A., Washington, D.C.

Paralysis or weakness of muscles of the upper extremity is frequently encountered as a result of neuromuscular disorders or trauma. Tightness of fascial planes and deformities are secondary characteristics. These conditions, without bone or joint injury, seldom merit immobilization. Protection, support, and methods designed to assist and promote functional capacity must be considered. The prescription of the device or technique is a responsibility of the physician. The device must be examined when it is completed by the brace mechanic to make certain that it is properly fitted and that its purpose is being accomplished. It follows that the patient must be frequently re-examined to determine whether increased functional capacity necessitates an alteration or discontinuance of the device prescribed.

A physician who accepts responsibility to manage weakness of the upper extremity must recognize the advantages and the limitations of functional aids. There is nothing that will provide a satisfactory substitute for good medical judgment and adequate general medical care of good quality. There are times when motion and activity are most important, and there are times when rest is equally important. Our remarks are directed toward the management of soft tissue injuries that have been completely and adequately treated by medical and surgical techniques in the early and acute stages. This is particularly true of patients with extensive soft tissue damage and in peripheral nerve injuries. It is recognized that the time interval from original injury to the time when functional devices may be indicated will vary. It is never too early, however, for the specialist in physical medicine to think of the patient's disability in terms of functional capacity and total rehabilitation.

Any condition of the upper extremity which impairs function to any degree must be evaluated to determine the advisability of a functional device.

PRESCRIPTION FOR FUNCTIONAL DEVICES

In order to evaluate functional capacity, the physician must know the origin and insertion of muscle structures, their nerve supply, and nerve roots. He must know the normal and usual function of individual muscles and muscle groups. He must estimate ultimate potential functional capacity or the irreversible nature of a given lesion. Electromyography is an aid of unusual importance in this respect.

It is well recognized that devices used in hydrotherapy and electrotherapy must never be associated with the treatment of specific diseases. There is no substitute for a thorough study of the patient, a diagnosis and a plan of management based on sound medical principles. This applies to the use of functional devices. A piece of metal skilfully molded into specific contours cannot be regarded as a satisfactory device for a specific disability.

A functional aid can be intelligently prescribed only after a complete evaluation of individual weakness, tightness, and deformity, and it must be fitted to the contours and the needs of the individual patient. Certain functional aids may accomplish their purpose for long periods of time without change. Frequently, however, as functional capacity improves, alterations and changes are indicated and must be prescribed and fitted with the same care and diligence as the original device.

THE BRACE MECHANIC

The brace mechanic is a valuable ally of the physician. His primary mission is to produce an appliance exactly as it is prescribed. He should have a good mechanical background and an inventive capacity to provide a device to meet any need. He must have the judgment and patience to realize that changes are frequently indicated and necessary to provide protection, support, and functional assistance for the specific condition in which they are prescribed. No matter how appealing to the eye or how ingenious the device may be, it is worthless if it does not accomplish the result that is intended by the physician. The competent brace mechanic should work under the supervision of the physician who is prescribing for a particular patient. He should select material with consideration given to stability, durability, lightness, and comfort. The brace mechanic is an important member of the medical team, but he is not qualified by training or

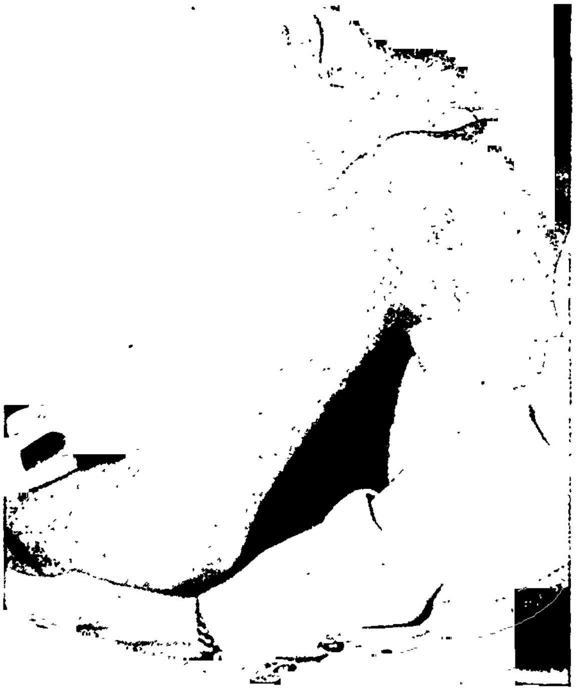

Fig. 1.—Defect in the origin of the mid-deltoid muscle.

Read before the Section on Physical Medicine and Rehabilitation at the One-Hundredth Annual Session of the American Medical Association, Atlantic City, June 15, 1951.

Chief, Physical Medicine Service, Brooke Army Hospital (Lieutenant Colonel Shields), and Chief, Physical Medicine Consultants Division, Office of the Surgeon General, Department of the Army (Colonel Smith).

experience to be completely responsible for both the prescription and the preparation of the aid. If the physician fails to assume his responsibility, the brace mechanic will do so and cannot logically be censured for this effort. The duty of the brace mechanic is to fill the prescription and then present the patient to the physician to determine whether the purpose of the device is realized.

FUNCTIONAL AIDS

Numerous excellent functional aids have been described for use in the treatment of upper extremity weakness. Bunnell [1] has used splints and braces to protect and support soft tissue disabilities of the upper extremities in a most effective manner. He has taught that a knowledge of structure and function is basic in efforts to prevent and correct deformity and to preserve and promote functional capacity.

Bennett [2] has popularized the use of the overhead sling in convalescent care of the weakened shoulder. He states: " . . . maximum return of functional capacity, within the limitations imposed by these basic lesions is dependent on three factors: (1) range of motion, (2) muscle group strength, and (3) coordination of muscle action. It is necessary that all articulations involved in the movement undertaken have sufficiently free and painless range of motion. Otherwise, the most effective use of muscles acting on these articulations can never be obtained."

Koch and Mason [3] have described purposeful splinting of the hand after injuries and infections. They emphasize rest and relaxation for injured and inflamed tissues, and in postoperative management they also stress "bringing constant and prolonged tension to bear upon scar tissue whose gradual contraction interferes with the function of the hand."

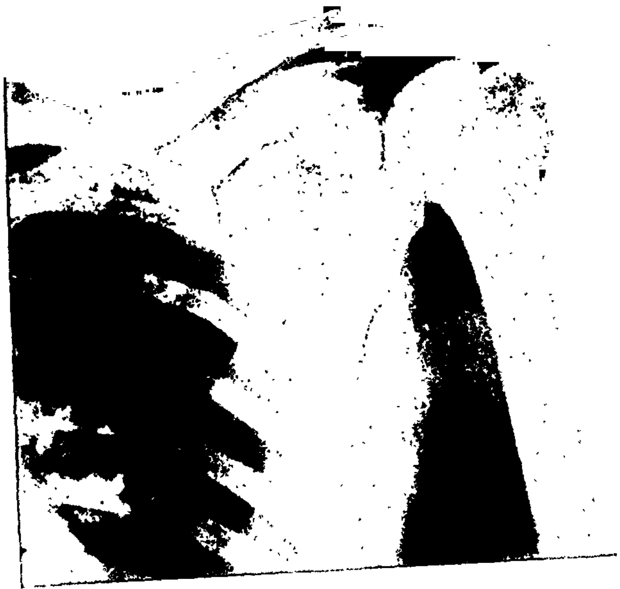

Fig. 2.—X-ray of the left shoulder shows comminuted fracture of the spine of the scapula, fracture of upper portion of glenoid, and a fragment from the acromion process displaced laterally.

Britt and Bennett [4] have described excellent supportive apparatus to aid in the accomplishment of maximum functional results in the care of weakness of the forearm and hand in the after-effects of poliomyelitis. They state, in discussing relationship of physical medicine to orthopedic surgery: "It should be remembered that the surgical results are greatly influenced by the caliber of early conservative care. Prevention or minimization of deformities and attainment of maximum coordination and strength will make surgery easier to perform and will facilitate the functional capacity."

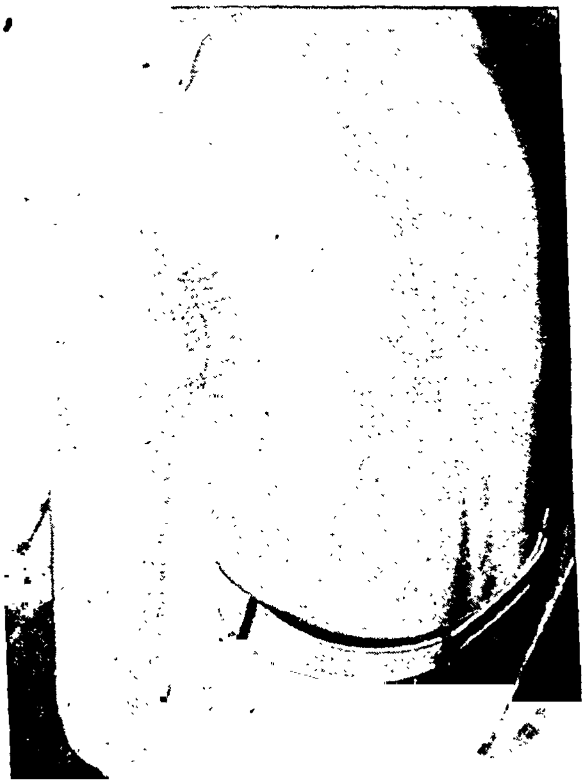

Fig. 3.—Maximum abduction before beginning treatment.

Report of a case is presented herewith to show the relationship of a functional device to the rehabilitation effort.

REPORT OF A CASE

A 22-year-old white soldier was wounded in action, in Korea, on Jan. 26, 1951. He received a perforating missile wound of the left shoulder; a compound, comminuted fracture of the left scapula; a perforating missile wound of the right upper arm; a perforating missile wound right forearm, with radial, median and ulnar nerve involvement; a compound, comminuted fracture, right ulna; and penetrating missile wound of the left lower leg. These injuries were the result of enemy mortar shell fragments. He was given first aid at an aid station and evacuated to an Army hospital in the forward area, where, on January 27, he was given penicillin and whole blood. Extensive débridement of his right arm and forearm and left shoulder was done. He was evacuated from this hospital on January 29, arriving at an Army hospital in Japan on January 30. Here débridement of the left lower leg was done on February 1. The patient was prepared for evacuation to the United States and left Japan on March 29, arriving at an Army hospital in the United States on April 6.

During his stay in Japan there was a secondary closure made of all the débrided areas. He received penicillin continuously during his stay in the hospital in Japan. On his arrival in the United States, his right arm was in a long arm cast.

He was presented to a joint rehabilitation clinic (orthopedic, plastic surgery, and physical medicine services) on April 19, principally because of marked limitation of range of motion along with atrophy of muscles of the left shoulder. There was a well-healed scar over the posterior aspect of the left shoulder, with some tightness. None of the muscles about the shoulder girdle were capable of overcoming gravity. There was a well-healed scar over the origin of the middle deltoid. The middle portion of the left deltoid appeared to be torn from its origin on the acromion process, as evidenced by a bulging of muscle belly without any tension as far as 6 cm. below the acromion process (fig. 1).

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[1] Bunnell, Sterling: Surgery of the Hand, Philadelphia, J. B. Lippincott Company, 1944.

[2] Bennett, R. L.: Convalescent Care of the Weakened Shoulder, with Particular Reference to Use of Overhead Sling, South. M. J. **40:** 120-127 (Feb.) 1947.

[3] Koch, S. L., and Mason, M. L.: Purposeful Splinting Following Injuries of the Hand, Surg., Gynec. & Obst. **68:** 1-16 (Jan.) 1939.

X-rays of the left shoulder revealed a comminuted fracture of the spine of the scapula, with wide spreading of the fragments, and also in an area of the scapula just below the spine, including the upper portion of the glenoid. One large fragment from the acromion process was displaced laterally just above the greater tuberosity of the humerus (fig. 2).

There was marked limitation of motion in all planes in the glenohumeral joint. The group considered closed manipulation, under anesthesia, to improve range of motion. The physical medicine service suggested that an electromyographic study be done to determine whether there was any peripheral nerve damage about the left shoulder. This was considered important because of the more prompt return of muscle strength to maintain active range if the muscle atrophy were due only to disuse. The left deltoid (anterior, middle, posterior), pectorals, infrapinatus, rhomboids, biceps, and triceps were sampled. Normal motor units were present, and there was no fibrillation of denervation. The members of the rehabilitation clinic agreed to have the physical medicine service attempt to improve range of motion and muscle strength in the left shoulder by means of sling suspension and activity. Maximum abduction, left shoulder, before beginning treatment is shown in figure 3.

The patient was placed in a wheelchair with sling suspension during the day, and a program of activity in both physical and occupational therapy was prescribed. Figure 4 shows the patient working in occupational therapy in his sling suspension. Figure 5 demonstrates the increased active range of motion that resulted from this type of management 18 days after beginning treatment. There is complete passive range in the left shoulder joint in all planes. There is limitation of active abduction owing to weakness of deltoid and loss of origin of middle fibers. A surgical procedure to re-establish deltoid muscle continuity is planned for this patient.

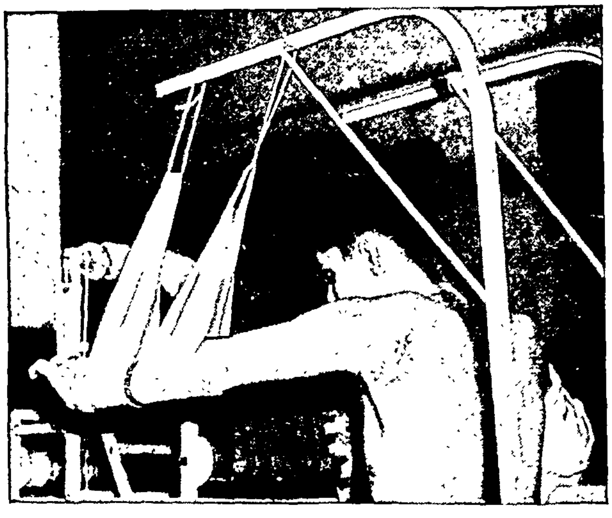

Fig. 4.—The patient working in occupational therapy in his sling suspension to improve muscle power and strength and range of motion.

COMMENT

This case is reported to demonstrate that bone and soft tissue damage are frequently associated in the same segment after trauma. Management of this type of injury is a joint responsibility of the physiatrist and the orthopedic surgeon. Protection and support of the segment, prevention of ankylosis, and improvement in function and muscle strength are the purposes of the functional device described in this report. Because of the destruction of the origin of the middle deltoid muscle, this patient has also incidently received preoperative care. Because the weakness in this left shoulder segment is due partially to a muscle mechanical fault, this patient will be in sling suspension until the orthopedic service elects to reconstruct the muscle, and he will then be given the same protection and support along with a program of activity until the best possible functional result is obtained.

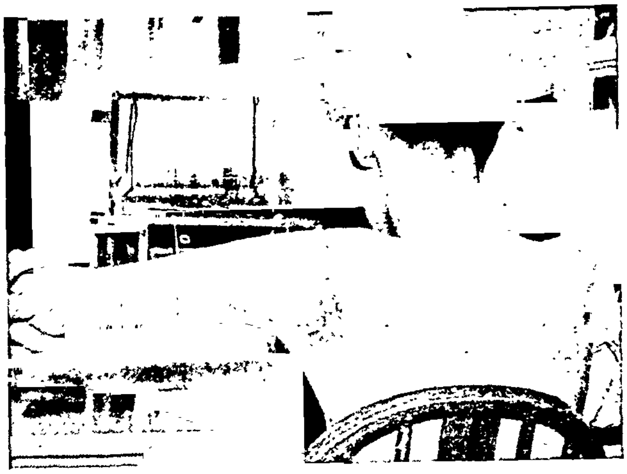

Fig. 5.—Increased active range of abduction, which resulted from this type of management 18 days after beginning treatment.

SUMMARY

1. The use of functional devices in the management of soft tissue disabilities in the upper extremity is discussed in general terms.

2. A case is reported to demonstrate the use of a particular device in the management of a patient with both soft tissue and bone damage in a shoulder segment.

3. Any condition that impairs function of the upper extremity should be evaluated to determine the advisability of a functional device.

4. The prescription of the device or technique is a responsibility of the physician.

5. It is the duty of the physician to evaluate muscle weakness, tightness, and deformity and to prescribe the device.

6. It is the duty of the brace mechanic to produce a device that will accomplish the purpose intended by the physician.

7. A functional device should be fitted to the individual patient.

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4. Britt, L. P., and Bennett, R. L.: Care of the After-Effects of Poliomyelitis: Forearm and Hand, Arch. Phys. Med. 31: 646-653 (Oct.) 1950.

Fatigue and Psychoneurosis.—Physicians can easily lose sight of the fact too that fatigue and lack of energy often do not represent disease of organs so much as they represent an emotional disorder involving the entire personality structure. In ordinary life, normal people are hardly liable to genuine exhaustion, since recovery from physical fatigue is rapid. However, some persons are truly exhausted in the physical sense because of a neurosis.—H. E. Harms, M.D., and T. L. L. Soniat, M.D The Meaning of Fatigue, *The Medical Clinics of North* March, 1952.

experience to be completely responsible for both the prescription and the preparation of the aid. If the physician fails to assume his responsibility, the brace mechanic will do so and cannot logically be censured for this effort. The duty of the brace mechanic is to fill the prescription and then present the patient to the physician to determine whether the purpose of the device is realized.

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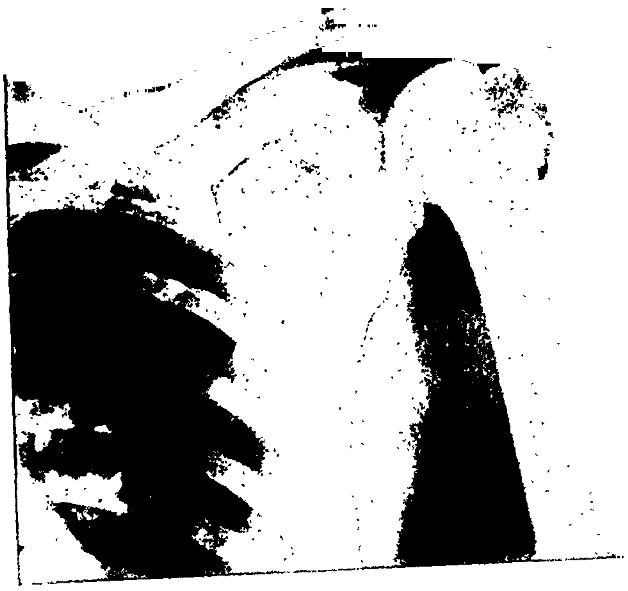

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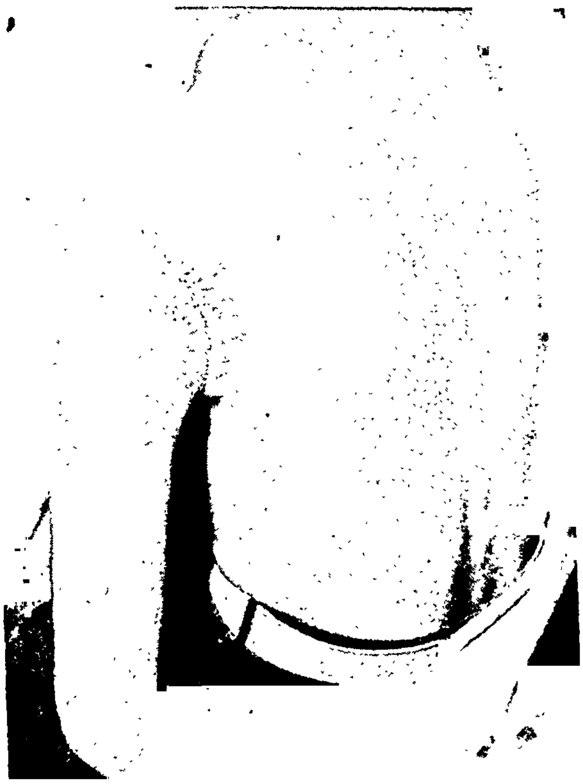

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Report of a case is presented herewith to show the relationship of a functional device to the rehabilitation effort.

REPORT OF A CASE

A 22-year-old white soldier was wounded in action, in Korea, on Jan. 26, 1951. He received a perforating missile wound of the left shoulder; a compound, comminuted fracture of the left scapula; a perforating missile wound of the right upper arm; a perforating missile wound right forearm, with radial, median and ulnar nerve involvement; a compound, comminuted fracture, right ulna; and penetrating missile wound of the left lower leg. These injuries were the result of enemy mortar shell fragments. He was given first aid at an aid station and evacuated to an Army hospital in the forward area, where, on January 27, he was given penicillin and whole blood. Extensive débridement of his right arm and forearm and left shoulder was done. He was evacuated from this hospital on January 29, arriving at an Army hospital in Japan on January 30. Here débridement of the left lower leg was done on February 1. The patient was prepared for evacuation to the United States and left Japan on March 29, arriving at an Army hospital in the United States on April 6.

During his stay in Japan there was a secondary closure made of all the débrided areas. He received penicillin continuously during his stay in the hospital in Japan. On his arrival in the United States, his right arm was in a long arm cast.

He was presented to a joint rehabilitation clinic (orthopedic, plastic surgery, and physical medicine services) on April 19, principally because of marked limitation of range of motion along with atrophy of muscles of the left shoulder. There was a well-

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1. Bunnell, Sterling: Surgery of the Hand, Philadelphia, J. B. Lippincott Company, 1944.
2. Bennett, R. L.: Convalescent Care of the Weakened Shoulder, with Particular Reference to Use of Overhead Sling, South. M. J. 40: 120-127 (Feb.) 1947.
3. Koch, S. L., and Mason, M. L.: Purposeful Splinting Following Injuries of the Hand, Surg., Gynec. & Obst. 68: 1-16 (Jan.) 1939.

COMMENT

One can only speculate about the origin of the cardiac lesion in this patient. The endocardial change and the thrombi may well have been caused by a much earlier rheumatic disease, although no evidence of valvular disease was discovered. Lueth [3a] reported a somewhat similar case, in which there was rheumatic mitral and aortic stenosis with a large organized thrombus in the left auricle, and Delannoy [4] reported a case with mitral valvular disease. It is possible that the atheromatous change was superimposed on rheumatic aortitis localized in this area of the aorta. Duguid [5] believes that organized mural thrombi are a common cause of intimal thickening, which sometimes undergoes a fatty change identical with atherosclerosis. The progression of the disease appears to be very slow, extending over a number of years. It eventually leads to death from gangrene, unless renal artery involvement produces hypertension, in which case death results from heart disease or uremia.[6]

SUMMARY

Thrombotic obliteration of the abdominal aorta occurs most commonly in middle-aged men. Heart disease is commonly associated with it. The patient reported on here was a young woman with mural endocarditis and multiple intracardiac thrombi. The question of rheumatic aortitis as an underlying factor is raised.

4438 Madison St. (Dr. Plice).

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4. Delannoy, E.: Résection du carrefour aortique et des bifurcations iliaques pour thrombose de l'aorte terminale, Mém. Acad. de chir. **71:** 89 (Feb. 28) 1945.

5. Duguid, J. B.: Thrombosis as a Factor in the Pathogenesis of Aortic Atherosclerosis, J. Path. & Bact. **60:** 57 (Jan.) 1948.

6. Straus, R.; Dominguez, R., and Merliss, R.: Slowly Progressive Occlusive Thrombosis of the Abdominal Portion of the Aorta, Am. J. M. Sc. **211:** 421 (April) 1946.

RUPTURED SPLEEN

DIAGNOSIS BY SERIAL X-RAY EXAMINATIONS

George Thomas, M.D.
Harry A. Reinhart, M.D., Vineland, N. J.
and
J. Gershon-Cohen, M.D., Philadelphia

The mortality from ruptured spleen, estimated at more than 75%, demands prompt diagnosis if effective surgery is to be employed.[1] In a recent review of roentgenography of ruptured spleen, the diagnostic value of serial examinations was emphasized.[2] The case reported herein exemplifies the accuracy of this procedure.

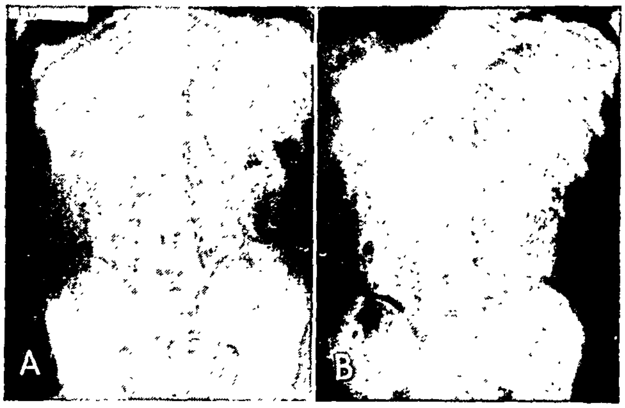
REPORT OF A CASE

J. M., a man aged 22, while playing baseball ran directly into another player, striking his left side against the other player's hip. The patient was winded and fell to the ground in shock. On his arrival at the hospital, a few minutes later, he was still in shock and received immediate treatment. At first the patient was pulseless, cyanotic, and semiconscious. His blood cell count revealed 3,800,000 red blood cells and 69% hemoglobin. His hematocrit was 31. It was not possible to obtain a blood pressure reading.

Approximately one hour after admission the patient began to complain of pain in the left shoulder area. This pain was so severe that x-rays of the chest as well as the abdomen were ordered. Physical examination showed that the patient was slightly cyanotic and perspiring freely. He was pulseless. Examination of the abdomen revealed considerable rigidity over the left upper quadrant. Two hours later, an x-ray examination revealed minimal elevation of the left part of the dome, but nothing else abnormal. No fractured ribs were detected. The radiologist suggested the possibility of a ruptured spleen and pointed out the advisability of repeated examinations to demonstrate any changes that might occur in the size and shape of the splenic shadow.

During the first 18 hours after hospitalization the patient recevied 3 pt. (1.5 liters) of blood and 3 pt. of plasma. Twelve hours after the first x-ray examination another x-ray of the abdomen was obtained. This revealed a slightly increased elevation of the left portion of the dome of the diaphragm, with a definite increase in the size and density of the splenic shadow. The splenic flexure was displaced downward. Increased width of the spaces between the distended small intestinal loops suggested the presence of free blood in the peritoneum. At this time the hematocrit had dropped to 20; red blood cell count was 4,300,000 and hemoglobin 65%. The blood pressure finally had risen to 70/30. The pulse rate at this time was approximately 100.

The patient was taken to the operating room, and, while a blood transfusion was being given, the abdominal cavity was opened. Much free blood was found within the peritoneum. The spleen was found completely ruptured into two separate segments, one of which was free within the peritoneal cavity; the other still remained attached to its pedicle. Both segments were removed. The patient made an uneventful recovery and was discharged from the hospital on the ninth day after his admission.



A, x-ray of the abdomen made two hours after injury to the left lower lateral portion of the chest, showing slight gaseous dilatation of the stomach but no other signs that might suggest the presence of a ruptured spleen. *B*, x-ray of the abdomen 12 hours later. The density of the splenic area has increased, and the size of this shadow has expanded downward and toward the right. This expanding shadow suggests a ruptured spleen with perisplenic hemorrhage. The increased separation between the loops of small intestines suggests free fluid (blood?) in the peritoneal cavity.

COMMENT

Rupture of the spleen with active bleeding resulting in shock often obscures the diagnostic symptoms and signs of ruptured spleen. It is at this stage that the x-ray examination can be of considerable help.[1] There are many valuable x-ray signs, such as dilatation of the stomach, serration of the margins of the greater curvature, elevation of the left portion of the diaphragmatic dome, downward displacement of the cardiac end of the stomach, downward displacement of the splenic flexure of the

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From the Department of Surgery, Newcomb Hospital (Drs. Thomas and Reinhart).

1. Wright, L. T., and Prigot, A.: Traumatic Subcutaneous Rupture of the Normal Spleen, Arch. Surg. **39:** 551-576 (Oct.) 1939. Roettig, L. C.; Nusbaum, W. D., and Curtis, G. M.: Traumatic Rupture of the Spleen, Am. J. Surg. **59:** 292-319 (Feb.) 1943.

2. Gershon-Cohen, J.; Hermel, M. B.; Byrne, R. N., and Bringhurst, L. S.: Rupture of the Spleen: Roentgen Diagnosis, Radiology **57:** 521-527 (Oct.) 1951.

colon, compression of the fundus, separation of the intestinal loops by fluid, obliteration of the splenic shadow, increased density of the shadow under the left side of the dome, displacement of the stomach to the left, and, finally, a progressively larger splenic shadow revealed by serial studies. Among these x-ray signs, the displacement of the stomach and of the splenic flexure of the colon with progressive increasing density and size of the splenic shadow as indicated by serial x-ray studies are probably most important.

SUMMARY

A case of ruptured spleen is reported in which serial x-ray examinations revealed an enlarging splenic shadow, increasing displacement of the splenic flexure of the colon, and separation of the intestinal loops by free blood in the peritoneum. The value of these findings is emphasized in the diagnosis of ruptured spleen.

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PRIMARY ADENOCARCINOMA OF THE ESOPHAGUS SIMULATING A BENIGN LESION

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R. H. Marshak, M.D., New York
and
A. I. Friedman, M.D., Hackensack, N. J.

Primary adenocarcinoma of the esophagus is an uncommon finding. In a series of 89 patients with carcinoma of the esophagus recently reported,[1] there occurred only one primary adenocarcinoma, the remainder of the lesions being squamous cell neoplasms. Garlock,[2] whose experience with this type of lesion has been considerable, has seen but three primary adenocarcinomas of the esophagus. Adenocarcinoma of the esophagus occurs invariably as a secondary extension of a gastric lesion by contiguous spread from the cardia. When adenocarcinoma of the esophagus is primary, the malignant development takes place in submucosal esophageal glands or in heterotopic gastric glands that may be present in the esophagus.

The following report is of a primary adenocarcinoma of the esophagus presenting the appearance of a benign submucosal lesion on x-ray examination. The diagnosis of a malignant neoplasm was made only after histopathological examination of tissue obtained by esophagoscopy.

REPORT OF A CASE

F. S., a 45-year-old white woman, was seen in July, 1949, with a complaint of progressive dysphagia of nine months' duration. The dysphagia was caused only by ingestion of solid foods. She described the sensation as a "bone that has not passed down." Later, the dysphagia appeared more specifically to be an inability to initiate the swallowing reflex. On attempting to swallow she would cough and regurgitate a small amount of fluid. The attempts to swallow were accompanied by a burning pain in the left anterior portion of the chest, adjacent to the manubrium, which frequently was relieved by vomiting. There was no substernal pain. There had been a weight loss of 2 lb. (0.9 kg.) in the previous three months. The past history was not pertinent; a hysterectomy had been performed in 1941 for uterine fibromyomas.

Physical examination disclosed nothing essentially abnormal. The blood pressure was 134/90; the heart and lungs were normal. Abdominal examination revealed a suprapubic scar; it was soft, and no viscera were palpable. Rectal and sigmoidoscopic examinations disclosed no abnormalities. Results of laboratory studies were all within normal limits. Barium meal examination revealed a smooth filling defect of the proximal portion of the lower third of the esophagus 11 cm. above the diaphragm. The mass possessed sharply delineated margins and an intact mucous membrane pattern and measured approximately 3 cm. in diameter. There was no evidence of ulceration. The appearance suggested a benign submucosal tumor (myoma). The stomach and remainder of the intestinal tract were normal (figs. 1 and 2).

At esophagoscopy a large, hard mass was seen 30 cm. from the upper incisor teeth, protruding into the lumen and causing obstruction. The lumen was narrowed to several millimeters. The mucous membrane appeared intact but was arranged in ridges over the mass. A biopsy of the neoplasm was made; the histopathological report was columnar cell carcinoma (adenocarcinoma), probably of gastric origin. Because of the pathological diagnosis of adenocarcinoma, we again examined the patient roentgenographically to determine whether the lesion was primary in the stomach. The stomach again appeared to be entirely normal. The tumor was considered, radiologically, esophageal in origin, because submucosal infiltration between the cardia of the stomach and the area occupied by this lesion would be most unusual.

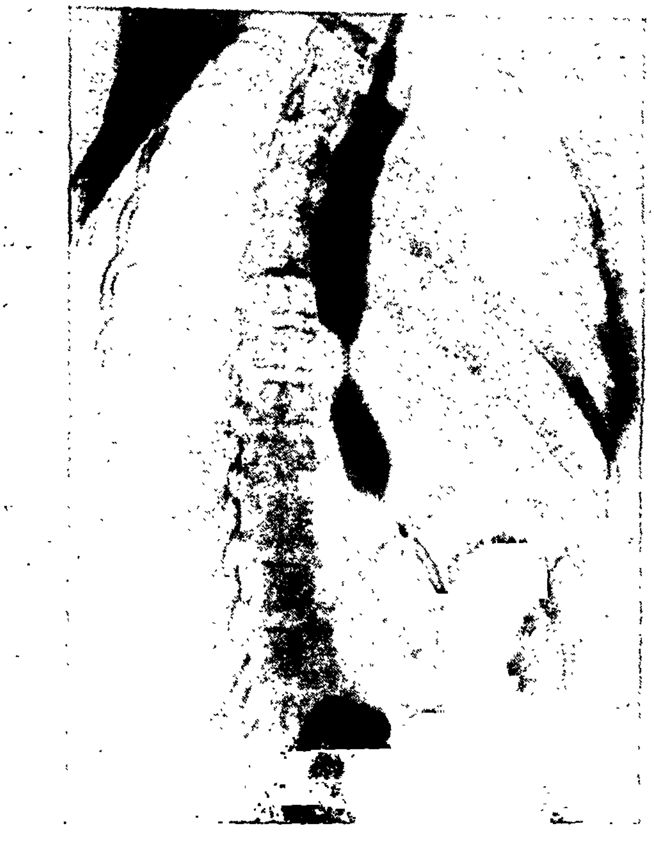

Fig. 1.—A smoothly marginated, filling defect, measuring 3 cm. in diameter, is seen at the junction of the middle and lower thirds of the esophagus, 11 cm. above the diaphragm. The remainder of the upper part of the gastrointestinal tract appears normal.

At operation, performed by Dr. John H. Garlock, a careful search of the stomach was made to determine whether this submucosal adenocarcinoma had any primary site in the gastric wall, but the small encapsulated mass between the middle and lower thirds of the esophagus, completely localized to the submucosal area, was the only lesion discovered. No lymph nodes were palpable. Transthoracic esophagogastrostomy with a supra-aortic anastomosis was performed.

From the Otolaryngological and Radiologic Services of Mount Sinai Hospital, New York.

[1] Gibbon, J. H., Jr.; Allbritten, F. F., Jr., and Templeton, J. Y., III: Carcinoma of Esophagus and Gastric Cardia, J. A. M. A. 145:1035 (April 7) 1951.

[2] Garlock, J. H.: Personal communication to the authors.

Convalescence was complicated by a leak at the esophagogastric suture line, resulting in pneumothorax of the left side of the chest, shifting mediastinum, and effusion into the pleural cavity on the left. Thoracotomy for relief of the empyema was followed by complete recovery.

Pathological Report.—The lesion was a circular, flat, button-shaped, firm, indurated mass, 2 cm. in diameter, lying in the esophageal wall. The mucosa over the tumor was intact, yellowish, thick, and firmly adherent. Section of the tumor revealed that the muscularis in most areas was not invaded, but in others the tumor infiltrated to the serosal wall. There was no extra-esophageal spread of the lesion. The final diagnosis was an infiltrating adenocarcinoma arising beneath the surface epithelium, most probably from the submucosal esophageal glands. No evidence of metastasis was observed at last examination, November, 1951.

COMMENT

This case is unusual because primary adenocarcinoma of the esophagus is rare and because adenocarcinoma rarely simulates a benign lesion. Though esophageal mucous glands are uncommon in the distal portion of the esophagus, the pathological report suggests that the lesion originated from the submucosal esophageal glands. This primary adenocarcinoma of the esophagus simulated a benign lesion because it was completely encapsulated and submucosal. It was extraluminal, yet entirely intramural, and on roentgen examination it presented the characteristics of a benign lesion, i. e., a smooth filling defect with no destruction or distortion of the normal mucosal folds.[3] Ulceration into the mucosa had not yet occurred, though undoubtedly, had the lesion not been identified, it would have eventually broken through into the lumen of the esophagus.

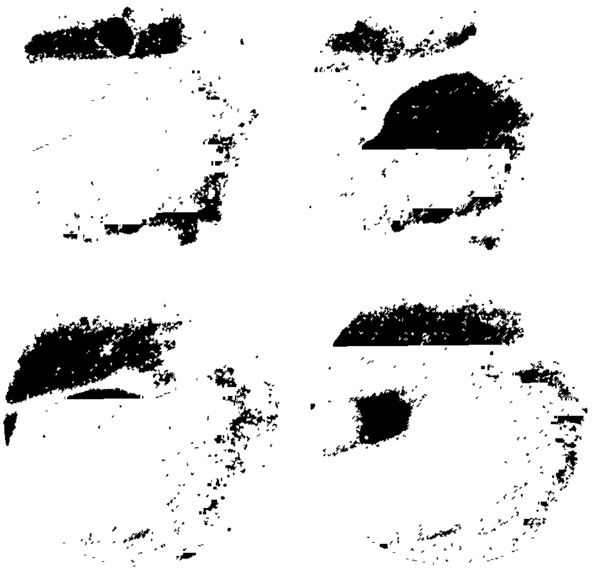

Fig. 2.—Spot roentgenographic studies exhibit the abrupt, smoothly marginated, filling defect. The mucosal pattern covering the lesion appears entirely normal.

CONCLUSION

The occurrence of a primary adenocarcinoma of the lower third of the esophagus, originating in the submucosal glands, is described as an unusual clinical entity. The roentgen appearance of the lesion belied its malignant nature, since the tumor presented no invasive qualities and no destruction of the mucosa. Definitive diagnosis could be made only by histopathological examination of tissue obtained by esophagoscopy.

1050 Park Ave. (Dr. Goldman).

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[3] Schatzki, R., and Hawes, L. E.: Tumors of Esophagus Below Mucosa and Their Roentgenological Differential Diagnosis, Rev. Gastroenterol. **17**: 991 (Nov.) 1950.

DEMONSTRATION OF L. E. CELLS IN PERICARDIAL FLUID

REPORT OF A CASE

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The value of the so-called lupus erythematosus (L. E.) inclusion phenomenon of bone marrow and blood as an aid in the diagnosis of acute disseminated lupus erythematosus has been amply demonstrated.[1] It is the purpose of this paper to report a case of pericardial effusion due to acute disseminated lupus erythematosus in which the diagnosis was first intimated by the finding of L. E. cells in the Wright-stained buffy coat smears of the patient's oxalated pericardial fluid. Subsequently, large numbers of L. E. cells were demonstrated in buffy coat preparations made from an oxalated marrow specimen from the same patient. Response to cortisone therapy was striking and led to rapid resorption of the pericardial effusion.

REPORT OF A CASE

A 38-year-old white woman was well until May, 1950, at which time pain developed in the right thigh, with subsequent pain and swelling in the right leg and foot. In August, 1950, she was hospitalized and treated for thrombophlebitis, with prompt recovery. A positive serology was demonstrated at that hospital, and she was treated for latent syphilis with a course of penicillin in September, 1950. On September 11, she was first admitted to Multnomah County Hospital with tenonitis of the left eye, which responded well to symptomatic measures and penicillin therapy. On this admission the spleen was noted to be palpable 2 cm. below the left costal margin on maximum inspiration. She was discharged on September 18. In October, 1950, pain, tenderness, and induration appeared in the left lower calf. These symptoms cleared with elevation and hot packing. On October 22 and November 12, she experienced sharp substernal pains lasting about 10 minutes, associated with dyspnea, and of sufficient severity to awaken her from a deep sleep. On November 19, exertional dyspnea and orthopnea first appeared together with a raw soreness of the throat and upper part of the chest. On November 22, repeated episodes of sharp precordial pain, lasting 15 to 60 seconds each, became so severe and fre-

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From the Division of Experimental Medicine and the Department of Medicine, University of Oregon Medical School Hospitals and Clinics.

[1] Hargraves, M. M.; Richmond, H., and Morton, R.: Presentation of 2 Bone Marrow Elements: The "Tart" Cell and the "L.E." Cell, Proc. Staff Meet., Mayo Clin. **23**: 25 (Jan. 21) 1948. Haserick, J. R., and Sundberg, R. D.: The Bone Marrow as a Diagnostic Aid in Acute Disseminated Lupus Erythematosus: Report on the Hargraves' "L.E." Cell, J. Invest. Dermat. **11**: 209 (Sept.) 1948. Haserick, J. R., and Bortz, D. W.: Normal Bone Marrow Inclusion Phenomena Induced by Lupus Erythematosus Plasma, ibid. **13**: 47 (Aug.) 1949. Sundberg, R. D., and Lick, N. B.: "L.E." Cells in the Blood in Acute Disseminated Lupus Erythematosus, ibid. **12**: 83 (Feb.) 1949. Dameshek, W., and Bloom, M. L.: Bone Marrow Examinations and the "L.E." Cell, editorial, Blood **5**: 101 (Jan.) 1950. Berman, L.; Axelrod, A.; Goodman, H., and McClaughry, R.: So-Called "Lupus Erythematosus Inclusion Phenomenon" of the Bone Marrow and the Blood, Am. J. Clin. Path. **20**: 403 (May) 1950.

quent that she paced the floor at night. Dyspnea and orthopnea became increasingly severe. She was readmitted to Multnomah County Hospital on November 27.

Examination revealed her to be a fairly well-developed and well-nourished woman in acute respiratory distress, with short gasping respirations and a peculiar grunting type of cough. Her temperature was 99.6 F, pulse rate 120 per minute, respiration rate 40 per minute, and blood pressure 114/84. She was cyanotic, though peripheral venous distention was slight. There was dulness to percussion bilaterally at the lung bases posteriorly, with diminished breath tones and scattered medium resonant rales. The area of cardiac dulness extended to the midaxillary line in the fifth interspace on the left and 4 cm. to the right of the midsternal line in the fourth interspace. There was increased lower sternal dulness and no localized apical beat. A systolic thrill was palpable at the apex. The mitral first sound was rather sharp, and the aortic and pulmonic second sounds were accentuated. No murmurs were heard. A loud pericardial friction rub was audible over most of the left anterior portion of the chest but disappeared when the patient leaned forward in a sitting position. The liver was palpable 4 cm. below the right costal margin and was tender. The spleen was not palpated initially. There was no palpable enlargement of the accessible lymph nodes. A few varicose veins were present bilaterally in the lower extremities.

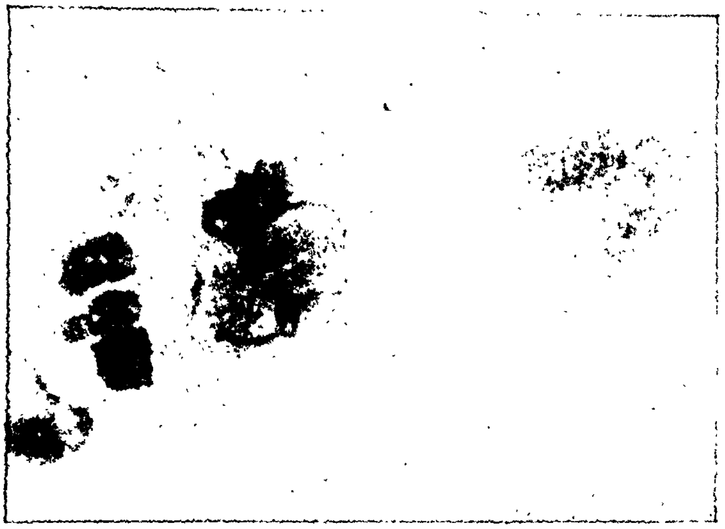
Fig. 1.—L.E. cell in the buffy coat smear of the patient's oxalated pericardial fluid (X approximately 1,250).

Laboratory examination showed 70% (9.7 gm.) hemoglobin, 3,040,000 erythrocytes, 5,300 leukocytes, with 58% segmented neutrophils, 1% band neutrophils, 2% segmented eosinophils, and 39% lymphocytes. The sedimentation rate was 19/109 (modified Westergren), and blood Kahn reaction 4+, and Kline 4+. Routine urinalysis showed no abnormal findings. No tubercle bacilli were found in concentration smear and culture of several sputum specimens. Venous pressure (antecubital) was 160 mm. of water. Arm to lung circulation time (ether) was less than 3 seconds. Arm to tongue circulation (sodium dehydrocholate [decholin®]) was 15 seconds. Purified protein derivative (Nos. 1 and 2) skin reactions were negative. A posteroanterior chest x-ray revealed a marked increase in the size of the cardiac shadow, possibly due to pericardial effusion. Cardiac fluoroscopy was not definitely diagnostic of effusion. Electrocardiograms were consistent with the diagnosis of subacute pericarditis.

The patient improved moderately on symptomatic therapy (bed rest, low salt diet, oxygen by nasal catheter, and meperidine [demerol®] hydrochloride for pain). The spleen was found to be palpable below the left costal margin on November 30. Pressure over the spleen produced pain in the left supraclavicular area. Paroxysms of coughing continued, and substernal pain was severe at times. A pericardial paracentesis yielded 140 cc. of serosanguinous fluid. This fluid contained 544 white blood cells per cubic millimeter with a differential count of 76% segmented neutrophils and 24% lymphocytes. There were 229,000 erythrocytes per cubic millimeter. Wright-stained buffy coat preparations of the pericardial fluid cells revealed L.E. cells to be present. A guinea pig inoculation with the pericardial fluid was performed and was negative for tuberculosis. Iliac marrow aspiration was carried out, and Wright-stained buffy coat preparations of the oxalated marrow specimen prepared by spinning the marrow at 3,000 rpm for five minutes revealed 229 L.E. cells per 500 segmented and band neutrophils. Accordingly, the diagnosis of acute disseminated lupus erythematosus was made. A pneumopericardium had been intentionally produced at the time of paracentesis, and subsequent roentgenogram disclosed a thickened pericardium. After the pericardial tap, dyspnea became slight. On December 23, cortisone therapy was instituted in the dosage of 300 mg. daily for two days, 200 mg. daily for two days, and then 100 mg. daily for three weeks before the dosage was tapered. The eosinophil count dropped from an initial 110 to 11 per cubic millimeter on the fourth day after cortisone therapy was started. Remarkable improvement ensued. She became euphoric and stopped complaining of transient abdominal pain. Dyspnea disappeared, and the liver and spleen regressed to normal size. On December 28, chest roentgenograms revealed disappearance of the pneumopericardium and a heart shadow markedly decreased in size from that seen in the x-ray taken 17 days previously. A moon facies developed, but the patient did not gain weight. After cortisone therapy was started, she was observed in the hospital for 10 days and had no recurrence of complaints other than a transient swelling and tenderness of the left leg. By Jan. 17, 1951, the electrocardiogram had reverted to normal. She was discharged asymptomatic on February 1, to be followed in the outpatient clinic. During February, dyspnea and knife-like pleuritic pain developed in the left lower part of the chest. The spleen was enlarged and tender, and it was felt that perisplenitis best explained these symptoms. Because of the persistence of these symptoms, she was readmitted on February 22 and treated symptomatically with partial relief. Admission hematological studies on this occasion revealed a leukocyte count of 2,750 per cubic millimeter with a normal differential. She was discharged on March 4. On March 22, she was again seen as an outpatient and was complaining of painful shoulders and painful interphalangeal joints. Splenomegaly was again demonstrated. She is still able to carry on almost normal activity but remains moderately symptomatic.

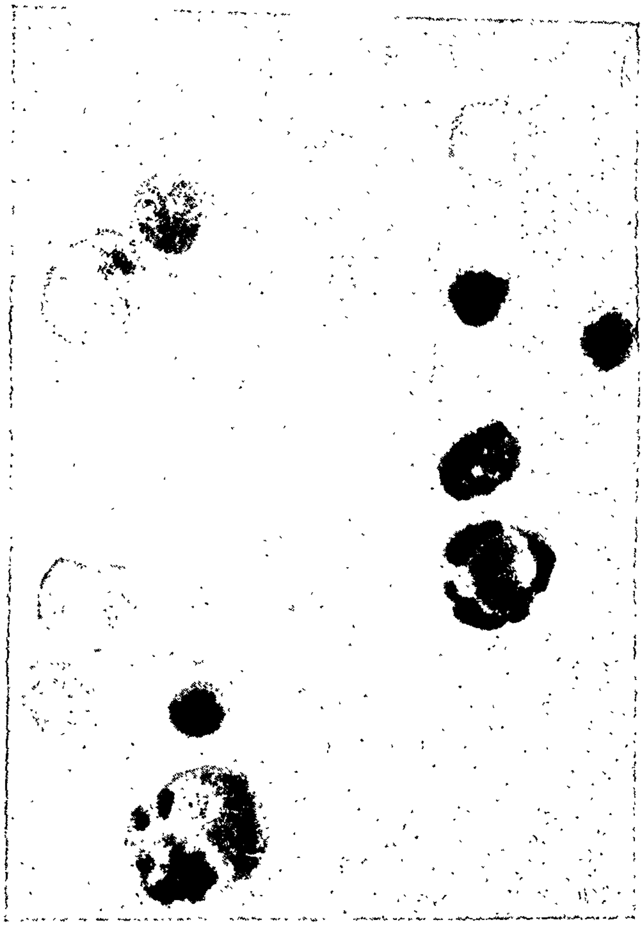
Fig. 2.—L.E. cells in the buffy coat smear of the patient's oxalated marrow (X approximately 1,065).

SUMMARY

L. E. cells were demonstrated in buffy coat preparations of oxalated pericardial fluid aspirated from a 38-year-old white woman with pericardial effusion, splenomegaly, perisplenitis, and hepatomegaly. Buffy coat preparations from oxalated marrow of the same patient revealed diagnostic numbers of L. E. cells. Remission was induced by cortisone therapy.

CONCLUSION

Examination of Wright-stained buffy coat preparations of pericardial fluid and other body cavity effusions [2] may prove valuable in alerting one to the possibility of acute disseminated lupus erythematosus as the underlying disease.

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[2] *Since preparation of this report, Dr. Raymond Grondahl, director of* laboratories, University of Oregon Medical School Hospitals and Clinics, has demonstrated L.E. cells in the buffy coat smear of oxalated pleural fluid from an additional patient, whose oxalated marrow buffy coat preparation contained 31 L.E. cells per 500 band and segmented neutrophils. However, necropsy findings in this patient revealed only the tissue changes of subacute glomerulonephritis without any diagnostic findings of acute disseminated lupus erythematosus.

COUNCIL ON PHYSICAL MEDICINE AND REHABILITATION

The Council on Physical Medicine and Rehabilitation has authorized publication of the following article.

The Council wishes to express its appreciation for the valuable cooperation of the Advisory Committee on Artificial Limbs. The Committee members are Drs. Rufus H. Alldredge, Henry H. Kessler, and Paul E. Klopsteg and Messrs. J. B. Korrady and Lucius Trautman. Ralph E. De Forest, M.D., *Secretary.*

CERTIFICATION PROGRAM ADOPTED BY PROSTHETIC AND ORTHOPEDIC APPLIANCE INDUSTRY

The American Board for the Certification of the Prosthetic and Orthopedic Appliance Industry, Inc., is the full name of the control program designed to create a new order of practices in the artificial limb and brace industry. Already the medical profession, which assisted in its development, is feeling the benefits, and the Council on Physical Medicine and Rehabilitation believed the story of this unique program should be published.

The Certification Program grew out of the desire of leaders in the industry, and their allies in the medical profession, to set up a system which would identify the competent and ethical firms and personnel who serve people requiring a prosthetic or orthopedic appliance. After two years of study and preparation, the Certification Program was officially launched in August, 1948.

Now a large percentage of all the firms and their fitters engaged in the fabrication and fitting of artificial limbs or braces have placed their credentials before the Board for review and approval. Also, fitters in hospitals and government limb and brace shops are applying for certification in increasing numbers.

Three eminent orthopedic surgeons and four outstanding representatives of the industry itself make up the Board of Directors which passes on the credentials of applicant firms and fitters. The three surgeons on the first Board were Dr. Atha Thomas of Denver, Dr. Rufus Alldredge of New Orleans, and Dr. Henry Kessler of Newark. The four industry representatives were Messrs. Chester C. Hadden of Denver, J. Blaine Korrady of Chicago, David E. Stolpe of New York, and Lee J. Fawver of Kansas City.

Mr. Haddan was elected the first President of the Board, Dr. Thomas, Vice President, and Mr. Korrady, Secretary-Treasurer. Members of the Board serve three years and it is the policy of the Board not to renew a Director's term of office.

The present Board consists of the following Directors: Chester C. Hadden, President; Dr. Atha Thomas, Vice President; Walter R. Sievers, New York, Secretary-Treasurer; David E. Stolpe, Chairman of Examinations; Dr. Charles O. Bechtol, San Francisco; D. A. McKeever, Atlanta, and Dr. Clinton L. Compere, Chicago.

The national office of the Board is in Washington, D. C., and is under the supervision of Glenn E. Jackson, the Executive Director for the Board.

In the certification of firms and fitters, distinction is made between limbs and braces as the skills involved in the two fields vary. Accordingly, fitters are classified and certified for one or the other according to their credentials. A few qualify for both. The same applies to firms.

A certified fitter of artificial limbs is designated as Certified Prosthetist while a certified fitter of braces is designated Certified Orthotist. It can be noted here that the Certification movement in this craft is establishing a clearer terminology. Example of this is the abandonment of the term "mechanic" formerly used to refer to fitters of these appliances.

The welfare and comfort of the physically handicapped is the central aim of the Certification Program. It is designed to obtain for the handicapped the highest possible standards of workmanship, fitting, and service, and the benefit of the latest technical advances. This is accomplished by setting up standards which a firm and fitter must meet as a condition of approval. Thus, in effect, a "Bureau of Standards" has been established for the industry.

A mounting body of public and medical opinion will provide the Board with an effective enforcement instrument.

Besides, the Board "stands behind" the products and services of certified firms thus assuring the public and agencies who use them that they can depend upon a certified firm. The machinery for accomplishing this is similar to that employed by the medical profession's organizations. In cases of dispute, the complainant and the complained-against firm each appoints a doctor and a prosthetist or orthotist, and the Board appoints the fifth person who acts as chairman of this Arbitration Committee.

Not only are the prosthetists and orthotists passed upon by the Board, but also the firm itself. This is a unique feature of the program. In licensing plans for other professions, the individual's own credentials are appraised, not the place in which he works. But those who laid the groundwork for this Certification Program believed that the patient needing a prosthetic or orthopedic appliance must be served by a competent fitter with a device that is adequately and ethically manufactured.

Accordingly, on the official application for firms appear such requirements as: suitable place of business, adequate shop, full conformity with health and fire rules, private washing and toilet facilities, private fitting rooms, adequate facilities for the training of patients in use of their appliances, and strict conformity with the Fair Practice rules governing the industry as approved by the Federal Trade Commission.

A fitter desiring certification must meet specific conditions. First of these is the requirement of four years' experience in being "responsibly related" to fitting of prosthetic or orthopedic appliances. Next, his basic statement on his application must be signed by at least two licensed physicians. The basic statement is the foundation on which the program is built. It reads:

"By-laws of the Corporation require that the Directors may certify as qualified fitters of prosthetic and orthopedic appliances *only* those persons competent to take required measurements or casts, and to shape, adjust, and align the appliance on sound anatomical and mechanical principles so that it satisfactorily carries out its intended function *in accordance with a doctor's prescription.*

"So that the Directors may fulfill this requirement in a practical way, the applicant will present this statement to two or more duly licensed physicians who, after reading *this paragraph* and any other portions of this application as filled in by the applicant, are respectfully asked to satisfy themselves each as he may see fit, that the applicant is *competent* as stipulated. The signatures of such physicians will be viewed by the Board as evidence that prescriptions for prosthetic and orthopedic appliances issued by them could in their opinion be satisfactorily fulfilled by the applicant."

When a fitter's application is found to meet these requirements the candidate is ready for examination. The examinations are held in the chief centers of the country. They consist of three parts: first, a written examination dealing chiefly with knowledge of anatomy, second, a thorough oral interview with the examining board. The third part is in a shop where, by actual demonstration, the candidate shows his all-round ability.

This examination system was launched in May, 1951. Already examinations have been held in New York, Atlanta, Los Angeles, and Chicago. Reports are that about 20% of the candidates who qualified and took the examinations during 1951 have failed while 80% have passed all tests and have been certified. The patch for a sleeve of a jacket, the gold pin for a coat, or the credentials card are evidences of certification for the guidance of doctors everywhere.

The Board considers that its standards are dynamic and not static. From the start it has been stated that the standards set during the opening year or so are to be considered as minimum. In its developmental stages, the Board submitted its plans to both the Federal Trade Commission and the Department of Justice for review and comment. Since the program of control was not to be one of government but of private enterprise, this was important. The reviewing officials praised the industry for its plans, especially commending the provision for both doctors and artisans on the controlling Board. This assured a dual result-control without illegal restraint of trade. It can be assumed that all decisions are fair and just to all concerned.

Every application of a firm or fitter is carefully investigated by a Board member when possible or by a committee, or both, so that the applicant must undergo a thorough examination before certification is granted. Filling out a questionnaire alone is not considered sufficient, but a personal investigation is made in every case.

The Certification Board plans to tighten the requirements in accordance with the needs and professional standards found to be desirable as the Certification Plan progresses.

Certified firms receive the official certificate for display in their places of business. It must be renewed annually, and current good standing is evidenced by display of a brass plate suspended beneath the certificate which carries the current calendar year inscribed prominently on it. Similarly, the certified fitter receives and must display his certificate. An annual card evidences his current good standing.

In accord with its policy of raising standards, the Board has been giving special attention to the problem of "salesmen" in the industry. Traditionally, firms employed salesmen to call on amputee prospects. This feature has been largely responsible in past years for the low status of the industry in the public eye. Of late years, however, an ever increasing percentage of ethical firms have rejected the salesman method. Determined to come to grips with this condition, the Board ruled in September, 1949, that certified firms must see to it that their patients, no matter where located, must be fitted by certified fitters, not by incompetent salesmen who may receive the appliance through the mail.

This matter came out in the open at the first annual meeting of the American Board for Certification attended by several hundred delegates from the industry.

Of special interest to the medical profession is the trend toward the requirement of a prescription as a prerequisite to fitting an appliance. The inability of some physicians to prescribe for the appliance is a deterrent in some places. The Board recognizes therefore that it can raise standards only so fast as conditions in both the medical profession and the industry itself permit.

Another aspect receiving attention is that of professional schooling and training. To date the industry has taught chiefly through the apprentice system. But the time is overdue for training schools to produce new personnel to take over as the current personnel leaves. A strong Educational Committee under the chairmanship of Dr. George Young, Assistant Director, Mellon Institute, Pittsburgh, has developed a curriculum and plans for future training schools for prosthetists and orthotists. The Board's educational requirements will be increased as these plans come into effect.

Interested physicians may secure a Registry of Certified Firms and Fitters, or other information, from the American Board for Certification, 336 Washington Building, Washington 5, D. C.

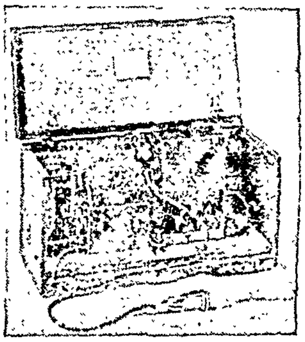
The Council on Physical Medicine and Rehabilitation has authorized publication of the following reports.

RALPH E. DE FOREST, M.D., *Secretary.*

JOHNSON RECORDING OSCILLOMETER ACCEPTED

Manufacturer: W. M. Welch Manufacturing Company, 1515 Sedgwick St., Chicago 10.

The Johnson Recording Oscillometer is a device for making permanent optical recordings of the vascular pulsations in the arms, legs, neck, and head. The member may be enclosed in a rigid-walled compartment (as in the procedure of finger plethysmography familiar to the physiologist) or encircled by an inflatable cuff (as is the arm in sphygmomanometry). The pulsations are thus translated into movements of the confined air, which are transmitted by tubing to a small glass chamber in which a small amount of alcohol oscillates in the path of a beam of light. These oscillations are photographed.



Johnson Recording Oscillometer

The instrument is housed in a wooden case that is provided with a handle for carrying and measures 31 by 51.5 by 25.5 cm. (12¼ by 22¼ by 10 in.). It weighs 20.4 kg. (37 lb.). The shipping weight is 31.7 kg. (70 lb.).

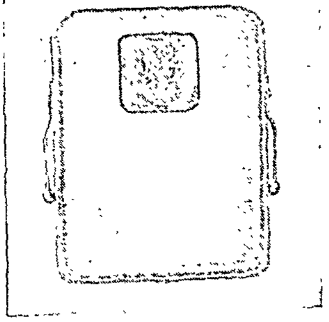
The following accessories, not included in the shipping weight, are available: Graph paper (plain, #8502); graph paper (with physician's name, #8502H); mounting sheets; adaptor for projector; transmitting mechanism; table with casters (#8502T).

The device requires a source of 60-cycle alternating current at 115 volts. The power consumption is 95 watts.

Evidence obtained from sources acceptable to the Council indicated that this instrument provides a convenient method for obtaining pulse-wave recordings as an aid in the diagnosis of cardiovascular disease. The Council on Physical Medicine and Rehabilitation voted to include the Johnson Recording Oscillometer in its list of accepted devices.

TONEMASTER HEARING AID, CAMEO MODEL, ACCEPTED

Manufacturer: Tonemaster, Inc., 400 S. Washington St., Peoria 2, Ill.



Tonemaster Hearing Aid
Cameo Model

The Tonemaster Hearing Aid, Cameo Model, is an electrical instrument housed in a plastic and metal case that measures 29 by 65 by 73 mm. It is equipped with an air conduction receiver and a plastic-coated receiver cord, and the total weight with batteries is 149 gm.

Tests in a laboratory acceptable to the Council showed that this instrument satisfied the minimum requirements of the Council for acceptable hearing aids. The Council on Physical Medicine and Rehabilitation voted to include the Tonemaster Hearing Aid, Cameo Model, in its list of acceptable devices.

HOSPITAL SERVICE IN THE UNITED STATES

THIRTY-FIRST ANNUAL PRESENTATION OF HOSPITAL DATA BY THE COUNCIL ON MEDICAL EDUCATION AND HOSPITALS OF THE AMERICAN MEDICAL ASSOCIATION

By F. H. Arestad, M.D., and Mary A. McGovern

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The present report of the Council on Medical Education and Hospitals reveals again a continued increase in the volume of hospital service in the United States. Most striking, perhaps, is the reported total of 18,237,118 patients admitted for hospital care in 1951, as compared with 17,023,513 the previous year. This represents an admission rate of one new patient every 1.7 seconds. There was also a new high in the number of hospital births, which in the last year totaled 2,999,371, or one live baby every 10.7 seconds. The highest previous total was 2,837,139 in 1947. The present bed capacity of 1,529,988 shows an increase of 73,076, while the average daily census of 1,293,653 is 50,876 more than was recorded in 1950. This indicates further that in the 12 month period covered in the present survey the hospitals registered by the American Medical Association gave a total of 472,183,345 days of patient care.

SUMMARY OF HOSPITAL DATA—1951

All Registered Hospitals		General Hospitals	
Number	6,637	Number	4,890
Bed capacity	1,529,988	Bed capacity	640,207
Bassinets	92,036	Bassinets	88,505
Patients admitted	18,237,118	Patients admitted	17,065,821
Births	2,999,371	Births	2,923,509
Average daily census	1,293,653	Average daily census	470,692
Patient days	472,183,345	Patient days	171,802,580

The 1951 report describes the scope of the present hospital survey and gives (1) statistical and other descriptive material on the number, size, and classification of hospitals, bed capacity, number of patients admitted, hospital births, percentage of beds occupied, average daily census, and total patient days; (2) information on professional and auxiliary nursing personnel, schools of nursing education, and student enrollment; (3) data on special services, including x-ray, laboratory, and outpatient departments; (4) information on general practice sections in hospitals; (5) a report on the number and types of hospitals utilizing the Standard Nomenclature of Diseases and Operations; and (6) a general report on the technical schools approved by the American Medical Association in the fields of medical technology, x-ray technique, physical therapy, occupational therapy, and medical record library science.

The lists of hospitals and technical schools included in THE JOURNAL in previous years have been revised and published as a separate supplement and will be distributed to all registered hospitals, medical schools, officers of the American Medical Association, members of the House of Delegates, members of the Board of Trustees, secretaries of state medical associations, editors of state medical journals, state boards of medical examiners, state and national hospital organizations, state boards of nurse examiners, state health officers, medical departments of the federal government, allied technical associations, and other agencies and to individual physicians on request.

As in previous years, the list of registered hospitals will contain special symbols designating the hospitals approved for intern and residency training, the hospitals accredited by the American College of Surgeons as meeting unconditionally the requirements for general standardization, and hospitals conducting schools of professional nursing education or affiliated training programs accredited by the respective state boards of nurse examiners.

The preparation of this report, as well as the lists of hospitals and technical schools, has been made possible only through the continued cooperation of the hospitals and schools represented. The Council, therefore, wishes to express its appreciation to the medical departments of the Army, Air Force, Navy, U. S. Public Health Service, Veterans Administration, Federal Security Agency, the administrators of individual hospitals, directors of technical schools, and all others who have generously assisted in the present survey.

TABLE A.—*Summary of Growth of Hospitals, 1909 to 1951*

	Federal Hospitals		State Hospitals		All Other Hospitals		Total	
Year	Number	Capacity	Number	Capacity	Number	Capacity	Number	Capacity
1909	71	8,827	232	189,049	4,056	223,189	4,359	421,065
1914	*93*	12,602	294	232,834	4,650	287,015	5,047	532,481
1918	110	18,815	303	262,254	4,910	331,182	*5,323*	*612,251*
1923	220	53,869	601	302,208	6,009	399,645	6,830	755,722
1928	291	61,765	595	369,759	5,963	461,410	6,852	892,934
1931	291	69,170	*576*	419,282	*5,746*	*485,663*	*6,613*	*974,115*
1932	301	74,151	568	442,601	5,693	497,602	6,562	1,014,351
1933	295	75,635	557	459,646	5,585	491,765	6,437	1,027,016
1934	*313*	77,865	544	473,035	5,477	497,201	6,334	*1,048,101*
1935	316	83,353	526	483,994	5,404	507,792	6,246	1,075,139
1936	323	81,234	521	503,306	5,342	509,181	6,189	1,096,721
1937	*329*	*97,951*	522	508,913	5,277	517,684	6,128	1,124,548
1938	330	92,248	523	541,279	5,313	527,853	6,166	1,161,380
1939	*329*	*96,338*	*523*	*560,575*	*5,374*	538,113	6,226	1,195,026
1940	336	108,928	521	572,079	*5,434*	515,238	6,291	1,226,245
1941	428	179,202	530	600,320	5,400	544,859	6,358	1,324,381
1942	474	220,938	530	606,437	5,341	556,452	6,345	1,383,827
1943	827	476,673	531	610,115	5,297	562,466	6,655	1,619,254
1944	798	551,135	539	609,025	5,274	569,785	6,611	1,729,915
1945	*705*	*546,384*	*549*	619,642	5,257	572,918	6,511	1,738,914
1946	461	264,486	557	628,363	5,259	575,865	6,280	1,468,714
1947	401	213,204	563	626,618	5,312	585,370	6,276	1,425,222
1948	372	185,098	567	618,386	5,396	590,036	6,335	1,423,520
1949	361	182,254	573	656,611	5,638	600,165	6,572	1,439,030
1950	*355*	*186,793*	*552*	*665,019*	*5,523*	605,100	6,430	1,456,912
1951	388	216,939	551	683,376	5,695	629,673	6,637	1,529,988

Scope of Survey

Represented in the present annual survey are 6,637 hospitals in the United States, 25 in Alaska, 6 in the Canal Zone, 2 in Guam, 37 in Hawaii, 43 in Puerto Rico, and 4 in the Virgin Islands. All of these appear in the supplemental list of registered hospitals, but the statistical report as here presented is limited solely to the 6,637 hospitals located within the Continental United States. Shown in this list are 1,325 hospitals approved by the American Medical Association for the training of interns and/or resident physicians. These include 865 approved for internships and 1,131 approved for residency training. A more detailed report on these educational programs will appear in the Internship and Residency Number of THE JOURNAL, Sept. 27, 1952. By special designations it is also shown that 2,740 hospitals are fully accredited under the general standardization program of the American College of Surgeons and that 1,106 have accredited professional schools of nursing aside from the 230 that offer acceptable affiliated training.

TABLE B.—*Number of Hospitals According to Size*

Bed Capacity	General Hospitals	Nervous and Mental	Tuberculosis	Other Hospitals	Total Number
25 and under..........	1,025	32	22	156	1,235
26-50..................	1,191	81	59	201	1,532
51-100..................	1,030	80	114	200	1,424
101-200..................	850	49	95	92	1,086
201-300..................	380	24	57	38	499
301 and over...........	414	330	83	34	861
Totals.............	4,890	596	430	721	6,637

Changes, corrections, and additions have been made in the registered list up to the date of publication, and, therefore, totals derived from the list itself may show slight variations from those presented in the tables of the statistical report.

Included in the present survey are also 496 schools of medical technology approved by the American Medical Association, 310 schools for x-ray technicians, 31 schools of physical therapy, 25 schools of occupational therapy, and 21 schools for medical record librarians.

Number, Size, and Classification of Hospitals

The registration of hospitals is carried out in accordance with standards officially adopted by the House of Delegates of the American Medical Association. These requirements, which appear under the title "Essentials of a Registered Hospital," were published in THE JOURNAL, May 7, 1949, pages 35-36. In the report of 1950 the number of registered hospitals was 6,430. Since that time, however, 411 additional registrations have been recorded, whereas 204 hospitals have been closed or otherwise removed from the registered list because of failure to supply the essential information requested in the annual hospital questionnaire. Thus, with a net increase of 207, the present registered list has been expanded to 6,637. These are all included in the hospital supplement, which shows the name and location of each institution, the control, type of service offered, number of beds and bassinets, total births during the year, number of patients admitted, and the average daily census.

TABLE C.—*Summary of Hospital Service Classified by Control*

	Hospitals	Beds	Bassinets	Admissions	Average Census	Births
Governmental						
Federal..................	388	216,939	2,907	1,489,581	167,792	85,935
State..................	554	683,376	2,043	767,599	645,672	68,477
County..................	633	107,458	5,981	1,066,562	88,931	170,425
City..................	377	77,736	6,027	1,257,575	61,123	196,733
City-county.............	80	12,211	1,464	285,098	9,554	50,722
Total governmental.....	2,032	1,097,720	18,422	4,866,415	973,072	572,292
Nongovernmental						
Church..................	1,116	154,053	28,292	5,152,206	117,572	983,760
Nonprofit associations..	2,121	225,903	36,672	6,695,804	168,577	1,197,648
Total nonprofit..........	3,237	379,956	64,964	11,848,010	286,149	2,181,408
Individual and partnership	966	27,527	5,310	820,493	16,564	131,539
Corporations (*profit* unrestricted)............	402	24,785	3,340	702,200	17,868	111,132
Total proprietary.......	*1,368*	*52,312*	*8,650*	*1,522,693*	*34,432*	*245,671*
Total nongovernmental.	4,605	432,268	73,614	13,370,703	320,581	2,427,079
Total all hospitals.......	6,637	1,529,988	92,036	18,237,118	1,293,653	2,999,371

TABLE D.—*Summary of Hospital Data According to Type of Service*

	Hospitals	Beds	Bassinets	Admissions	Average Census	Births
General..............	4,890	640,207	88,505	17,065,821	470,692	2,923,509
N & M..............	596	728,187	192	307,010	697,521	572
Tuberculosis..........	430	88,379	100	107,181	73,588	3,492
Maternity............	90	4,632	2,946	105,663	2,953	71,343
Industrial............	32	2,837	2	60,951	1,890	4
E. E. N. T............	53	2,595	...	114,516	1,502	...
Children's............	44	5,133	111	135,043	3,438	2
Orthopedic...........	82	6,708	25	33,009	5,209	1
Isolation..............	40	9,516	*63*	*101,026*	*5,097*	50
Conv. and rest........	120	7,115	11	38,057	5,078	34
Institutions..........	183	19,905	75	134,414	13,098	238
All other hospitals....	77	14,774	*6*	*34,427*	*13,587*	126
Total all hospitals..	6,637	1,529,988	92,036	18,237,118	1,293,653	2,999,371

The classification of hospitals by size may be observed in table B, where variations in bed capacity have been recorded in relation to general hospitals, psychiatric institutions, tuberculosis sanatoriums, and other hospitals. In this connection, it will be found that the various size groups are practically as described in the previous report, inasmuch as 63% of the registered hospitals report 100 beds or less, 24% have 101 to 300 beds, and 13% have 300 beds or more. The same pattern applies to the general hospitals, but in the psychiatric and tuberculosis fields a greater proportion of large institutions will be found. At present 34% of the general hospitals have more than 100 beds, whereas the corresponding ratios in the psychiatric and tuberculosis institutions are 68 and 55% respectively.

TABLE E.—*Governmental and Nongovernmental Hospital Service*

	Hospitals	Beds	Bassinets	Admissions	Average Census	Births
Governmental						
General	1,119	273,335	17,565	4,292,253	200,035	558,580
N & M	362	706,924	174	230,414	680,288	423
Tuberculosis	325	78,615	98	92,953	65,684	3,490
Other special	58	12,382	516	126,667	7,009	9,752
Institutions	168	26,434	69	124,128	20,056	47
Total governmental	2,032	1,097,720	18,422	4,866,415	973,072	572,292
Nongovernmental						
General	3,771	366,872	70,940	12,773,568	270,657	2,364,929
N & M	234	21,263	18	76,596	17,233	149
Tuberculosis	105	9,734	2	14,228	7,904	2
Other special	403	26,154	2,642	461,598	18,158	61,682
Institutions	92	8,245	12	44,713	6,629	317
Total nongovernmental	4,605	432,268	73,614	13,370,703	320,581	2,427,079
Total all hospitals	6,637	1,529,938	92,036	18,237,118	1,293,653	2,999,371

TABLE F.—*Summary of Federal Hospital Service in the United States According to Type of Service and Governmental Agencies Concerned from the 1951 Census of Hospitals Registered by the American Medical Association*

Type	Hospitals	Beds	Bassinets	Admissions	Average Census	Births
U. S. Army						
General	60	41,078	1,022	489,107	29,346	32,365
U. S. Air Force						
General	32	8,857	506	141,414	4,854	13,535
U. S. Navy						
General	35	28,021	846	244,817	18,069	29,756
U. S. Public Health Service						
General	18	4,899	36	60,386	3,954	917
N & M	2	2,400	...	5,072	2,285	1
TB	2	592	...	721	507	......
Other special	2	1,000	13	12,773	238	7
Institutions	18	1,402	6	11,581	772	19
Totals	42	10,293	55	90,533	7,756	944
Veterans Administration						
General	97	51,773	...	396,275	39,059	1
N & M	35	54,468	...	40,711	50,508	1
TB	20	10,253	...	18,731	7,596	......
Totals	152	116,494	...	455,717	97,163	2
Indian Affairs						
General	51	2,367	395	48,513	1,441	6,017
TB	5	779	...	2,671	668	......
Institutions	3	113	...	715	19	......
Totals	59	3,259	395	51,899	2,128	6,017
Other Federal						
General	4	602	80	11,869	491	3,307
N & M	1	6,785	3	1,412	6,780	9
Institutions	3	1,550	...	2,783	1,205	......
Totals	8	8,937	83	16,064	8,476	3,316
Total all Federal Hospitals	388	216,939	2,907	1,489,581	167,792	85,935

The control classification outlined in table C shows that 2,032, or 30.6%, of the registered hospitals operate under governmental control, whereas 4,605, or 69.4%, are in the nongovernmental group. Last year the corresponding ratios were 29.7 and 70.3%. At present 19% of the governmental hospitals are classified as federal, 27% as state institutions, 31% county, 18% municipal, and 4% city-county. In table E it may be observed that 55% of the governmental hospitals are general in type, while 18% operate as psychiatric institutions, 16% as tuberculosis hospitals, and 11% under other service classifications. Further reference to table G will show that the general hospitals predominate in all governmental divisions except the state group where, as in the previous report, 51% of the hospitals are devoted to psychiatric care and only 10% to general hospitalization.

TABLE G.—*Summary of Hospital Service in the United States According to Type of Service and Agencies Concerned from the 1951 Census of Hospitals Registered by the American Medical Association*

Type	Hospitals	Beds	Bassinets	Admissions	Average Census	Births
U. S. Totals	6,637	1,529,988	92,036	18,237,118	1,293,653	2,999,371
Federal						
General	297	137,597	2,885	1,392,411	97,214	85,898
N & M	38	63,653	3	47,195	59,573	11
TB	27	11,624	...	22,123	8,771	......
Other Special	2	1,000	13	12,773	238	7
Institutions	24	3,065	6	15,079	1,996	19
Totals	388	216,939	2,907	1,489,581	167,792	85,935
State						
General	56	20,971	1,749	403,253	16,118	66,947
N & M	282	619,151	163	174,815	597,927	411
TB	89	29,349	10	27,159	24,137	54
Other Special	22	4,918	64	74,694	2,857	1,043
Institutions	105	8,957	57	87,678	4,633	22
Totals	554	683,376	2,043	767,599	645,672	68,477
County						
General	391	50,254	5,572	1,011,626	37,756	161,707
N & M	40	23,299	8	8,067	22,104	......
TB	171	24,739	3	24,695	21,026	30
Other Special	10	2,955	398	14,418	2,344	8,688
Institutions	21	6,220	...	7,756	5,701	......
Totals	633	107,458	5,981	1,066,562	88,931	170,425
City						
General	307	54,139	5,920	1,204,663	40,962	193,306
N & M	2	830	...	337	684	1
TB	27	11,171	85	17,099	10,256	3,406
Other Special	23	3,404	16	21,861	1,195	14
Institutions	18	8,192	6	13,615	7,726	6
Totals	377	77,736	6,027	1,257,575	61,123	196,733
City-County						
General	68	10,374	1,439	280,300	7,985	50,722
N & M	...	......	...	....	......	......
TB	11	1,762	...	1,877	1,494	......
Other Special	1	75	25	2,921	75	......
Institutions	...	......	...	....	......	......
Totals	80	12,211	1,464	285,098	9,554	50,722
Church						
General	997	143,962	27,240	5,084,884	110,146	963,135
N & M	23	3,461	4	8,524	2,792	116
TB	14	1,615	...	2,837	1,403	......
Other Special	67	3,657	1,041	53,343	2,184	20,305
Institutions	15	1,358	7	2,618	1,047	204
Totals	1,116	154,053	28,292	5,152,206	117,572	983,760
Nonprofit						
General	1,722	186,770	35,289	6,288,084	138,354	1,161,241
N & M	45	7,433	6	16,092	6,410	1
TB	68	6,911	2	9,659	5,509	2
Other Special	222	18,260	1,370	346,031	12,945	36,291
Institutions	64	6,529	5	35,938	5,359	113
Totals	2,121	225,903	36,672	6,695,804	168,577	1,197,618
Individual and Partnership						
General	775	20,110	5,181	760,162	11,062	130,452
N & M	79	3,984	4	21,497	3,019	......
TB	17	708	...	1,000	551	......
Other Special	86	2,553	125	34,081	1,846	4,087
Institutions	9	172	...	3,753	86	......
Totals	966	27,527	5,310	820,493	16,564	134,539
Corporations						
General	277	16,030	3,230	640,438	11,095	110,101
N & M	87	6,385	4	30,483	5,012	32
Tuberculosis	6	500	...	732	441	......
Other Special	28	1,684	106	28,143	1,183	999
Institutions	4	186	...	2,404	137	......
Totals	402	24,785	3,340	702,200	17,868	111,132
Total all Hospitals	6,637	1,529,988	92,036	18,237,118	1,293,653	2,999,371

In the nongovernmental group, consisting of 4,605 hospitals, 2,121 are listed as nonprofit associations, while 1,116 other nonprofit hospitals appear under church control. Together these hospitals constitute 70% of the nongovernmental institutions, whereas the remaining 30% are represented by 1,368 proprietary hospitals, in-

Bed Capacity

Comparative Totals
1950: 1,456,912
1951: 1,529,988

The bed capacity in the hospitals registered by the American Medical Association reached its highest point in 1945, when a total of 1,738,944 beds were reported, as shown in table A. In the following three years the number declined to 1,423,520, incident mainly to changes in the federal group. A net gain of 15,510 beds occurred in 1949, with a further increase of 17,822 in 1950. Again in the last year the bed capacity increased by 73,076, and practically all divisions as shown in tables C and D shared in this advance. Included in the present total of 1,529,988 are 1,097,720 (71.7%) in governmental hospitals and 432,268 (28.3%) in the nongovernmental group. In the governmental divisions reported in table C the bed accommodations range from 12,211 in the city-county group to 683,376 in the state hospitals, where 619,151 beds are specifically allocated for psychiatric care. Table F shows a combined capacity of 216,939 beds in the federal classification. These include 116,494 in the Veterans group and 77,956 in

TABLE 1.—HOSPITAL FACILITIES BY STATES AND BY CONTROL: C. PROPRIETARY | TOTAL NONGOVERNMENTAL

Marginal No.		Individual and Partnership					Corporations (Profit Unrestricted)					Total Proprietary					Totals of Tables 1B and 1C					Marginal No.
		Hospitals	Beds	Bassinets	Patients Admitted	Average Census	Hospitals	Beds	Bassinets	Patients Admitted	Average Census	Hospitals	Beds	Bassinets	Patients Admitted	Average Census	Hospitals	Beds	Bassinets	Patients Admitted	Average Census	
1	Alabama..........	36	1,139	259	44,416	656	12	793	173	27,732	483	48	1,932	432	72,148	1,139	76	5,015	921	163,931	3,302	1
2	Arizona............	9	201	32	4,774	93	..	...	...	......	...	9	201	32	4,774	93	37	2,321	385	73,319	1,499	2
3	Arkansas.........	23	714	183	25,761	324	2	45	17	1,904	16	25	759	200	27,668	340	48	2,935	564	106,911	1,814	3
4	California.........	72	2,762	315	68,298	2,008	48	2,716	314	88,800	1,949	120	5,478	689	157,098	3,957	272	23,498	3,913	848,907	18,187	4
5	Colorado..........	9	372	35	5,062	287	4	164	16	3,071	125	13	536	51	8,133	412	74	6,085	826	167,205	4,364	5
6	Connecticut........	1	45	...	207	43	7	478	...	1,087	342	8	523	...	1,294	385	51	8,732	1,260	240,077	6,581	6
7	Delaware...........	..	.....	...	.....	...	1	15	6	373	8	1	15	6	373	8	9	1,291	235	38,335	857	7
8	Dist. of Columbia.	1	18	8	536	10	1	237	61	10,059	210	2	255	69	10,595	220	17	3,280	621	111,985	2,521	8
9	Florida...........	29	823	167	23,585	460	10	509	112	16,102	254	39	1,332	279	39,687	714	92	5,832	1,125	174,003	3,569	9
10	Georgia............	39	1,113	202	37,670	611	12	431	77	16,888	268	51	1,544	279	54,558	879	83	4,780	777	174,049	3,256	10
11	Idaho..............	9	206	46	7,531	113	1	28	10	1,841	20	10	234	56	9,372	133	34	1,660	425	59,526	931	11
12	Illinois.............	35	1,176	59	11,207	826	23	1,527	91	23,863	1,126	58	2,703	150	35,070	1,952	261	30,953	4,872	895,681	23,859	12
13	Indiana............	11	261	40	7,673	160	5	450	20	14,660	288	16	711	60	22,333	448	69	7,842	1,477	290,952	6,104	13
14	Iowa..............	22	504	129	13,528	326	4	152	27	3,792	112	26	656	156	17,320	438	97	7,746	1,449	249,376	5,816	14
15	Kansas............	14	286	75	6,912	149	..	...	...	......	...	14	286	75	6,912	149	83	5,781	1,097	179,757	4,161	15
16	Kentucky..........	14	402	95	13,311	189	9	459	67	19,010	316	23	861	162	32,351	505	80	5,993	1,015	201,971	4,131	16
17	Louisiana..........	47	1,138	293	47,141	604	12	489	72	18,142	283	59	1,627	365	65,283	887	95	5,692	989	217,753	3,645	17
18	Maine..............	4	96	32	2,366	61	3	91	14	2,261	66	7	187	46	4,627	127	42	2,734	540	83,117	1,942	18
19	Maryland..........	6	235	8	1,614	174	4	262	12	2,692	204	10	497	20	4,306	378	53	7,401	870	169,859	5,683	19
20	Massachusetts.....	5	145	20	2,785	90	16	765	100	16,085	546	21	910	120	18,870	636	149	16,527	2,960	449,343	12,186	20
21	Michigan..........	20	559	60	9,421	405	7	380	...	3,310	309	27	939	60	12,731	714	160	16,558	3,111	561,464	13,065	21
22	Minnesota.........	17	293	88	6,679	161	10	824	16	24,192	641	27	1,117	104	30,871	802	140	10,998	1,828	354,742	8,350	22
23	Mississippi........	19	543	101	16,514	249	4	171	27	6,784	94	23	714	128	23,298	343	61	2,931	555	122,176	1,892	23
24	Missouri...........	22	624	167	18,848	410	11	449	133	8,006	272	32	1,023	275	26,718	651	116	12,086	2,027	334,262	9,576	24
25	Montana...........	4	107	23	3,018	63	2	48	7	2,048	22	6	155	30	5,066	85	44	2,939	589	92,247	2,188	25
26	Nebraska..........	27	560	176	15,850	280	5	228	36	3,572	159	32	788	212	19,422	439	88	5,009	1,032	150,098	3,279	26
27	Nevada............	1	45	12	2,033	28	..	...	...	......	...	1	45	12	2,033	28	5	255	55	9,367	153	27
28	New Hampshire....	..	.....	...	.....	...	1	45	...	75	43	1	45	...	75	43	29	2,142	434	63,045	1,400	28
29	New Jersey........	6	412	11	1,407	338	6	327	...	961	263	13	789	36	2,504	632	111	15,070	2,498	412,771	11,272	29
30	New Mexico........	1	20	...	47	5	..	...	...	......	...	1	20	...	47	5	24	1,342	267	41,886	836	30
31	New York..........	38	1,765	253	33,677	1,162	32	3,659	599	111,154	2,724	69	5,381	852	143,141	3,858	361	54,034	7,517	1,353,578	41,916	31
32	North Carolina....	21	575	128	20,569	320	4	316	24	5,455	199	25	891	152	26,024	519	124	9,540	1,892	362,390	6,598	32
33	North Dakota.....	..	.....	...	.....	...	..	...	...	......	...	..	...	...	......	...	36	2,576	520	84,461	1,656	33
34	Ohio...............	9	281	14	2,869	220	10	706	18	6,540	589	19	987	32	9,409	809	164	21,406	3,649	733,503	17,308	34
35	Oklahoma.........	34	1,070	247	40,803	661	5	255	29	6,840	176	39	1,325	276	47,643	837	72	4,272	862	147,866	2,899	35
36	Oregon............	10	297	68	11,871	166	12	832	117	16,543	645	22	1,129	185	28,414	811	59	4,796	883	163,507	3,536	36
37	Pennsylvania......	17	584	58	7,541	401	8	394	18	3,125	335	25	978	76	10,666	736	275	40,179	6,451	1,062,312	31,177	37
38	Rhode Island......	..	.....	...	.....	...	..	...	...	......	...	..	...	...	......	...	16	2,420	432	64,086	1,862	38
39	South Carolina....	7	180	31	6,205	76	3	158	25	3,714	81	10	338	56	9,919	157	38	3,255	573	109,605	2,111	39
40	South Dakota.....	3	47	17	1,443	29	..	...	...	......	...	3	47	17	1,443	29	41	2,864	554	91,329	1,932	40
41	Tennessee.........	39	956	211	34,037	528	15	557	106	22,480	371	54	1,513	317	56,517	899	95	6,246	1,028	217,193	4,543	41
42	Texas..............	217	4,759	1,142	186,191	2,491	38	1,635	330	63,991	1,071	256	6,437	1,472	251,872	3,593	395	18,156	3,468	690,931	11,562	42
43	Utah...............	6	138	57	5,011	72	..	...	...	......	...	6	138	57	5,011	72	22	1,818	514	66,688	1,183	43-
44	Vermont...........	2	42	17	1,004	20	..	...	...	......	...	2	42	17	1,004	20	23	2,244	327	47,686	1,753	44
45	Virginia...........	15	526	113	18,792	305	22	1,895	305	68,237	1,468	37	2,421	418	87,029	1,773	86	7,345	1,401	255,989	5,200	45
46	Washington.......	18	614	114	21,719	399	5	212	34	3,414	125	23	826	148	25,133	524	87	7,455	1,577	278,390	5,188	46
47	West Virginia......	8	523	72	21,365	394	20	1,595	271	69,817	1,273	28	2,118	343	91,182	1,667	57	5,519	869	207,949	4,379	47
48	Wisconsin.........	13	253	71	6,081	154	8	488	26	3,580	392	21	741	97	9,661	546	137	12,291	2,257	381,434	9,122	48
49	Wyoming..........	6	118	31	3,085	40	..	...	...	......	...	6	118	31	3,085	40	17	421	123	13,661	187	49
	Totals (1951)....	966	27,527	5,310	820,493	16,564	402	24,785	3,340	702,200	17,868	1,368	52,312	8,650	1,522,693	34,432	4,605	432,268	73,614	13,370,703	320,581	
	(1950)....	958	26,561	5,321	774,937	15,914	391	24,444	3,490	677,304	17,287	1,349	51,005	8,811	1,452,241	33,231	4,518	419,871	72,587	12,706,143	311,316	
	(1949)....	1,077	29,669	6,099	870,668	17,917	401	24,315	3,673	682,443	17,193	1,478	53,984	9,772	1,553,111	35,140	4,635	413,875	73,001	12,401,188	309,108	
	(1948)....	973	27,567	5,668	814,776	17,457	378	23,214	3,536	664,222	17,078	1,351	50,781	9,204	1,478,998	34,535	4,435	403,753	71,839	12,132,283	309,585	
	(1947)....	984	28,325	6,137	818,082	18,303	359	22,111	3,262	599,580	16,708	1,343	50,436	9,399	1,447,662	35,011	4,359	395,017	70,654	11,625,170	312,626	
	(1946)....	980	28,116	6,114	817,301	17,114	346	20,883	2,927	539,829	15,470	1,326	48,999	9,041	1,357,130	32,584	4,318	385,980	68,417	10,555,289	301,522	
	(1945)....	987	30,216	5,597	715,908	17,442	351	20,724	2,986	509,569	15,140	1,338	50,940	8,583	1,225,477	32,582	4,328	382,226	66,545	9,858,289	290,833	
	(1944)....	1,011	27,301	5,618	678,965	16,972	357	21,652	3,052	508,624	16,051	1,368	48,953	8,700	1,187,589	33,023	4,349	377,667	65,502	9,491,628	283,291	
	(1943)....	1,031	27,314	5,370	638,999	16,282	384	23,094	3,187	513,202	15,865	1,415	50,408	8,557	1,152,201	32,147	4,371	373,115	63,295	9,111,871	273,392	
	(1942)....	1,089	27,996	5,147	576,466	15,715	406	23,759	3,057	495,821	15,521	1,495	51,755	8,204	1,072,287	31,236	4,421	368,046	59,620	8,535,935	267,390	
	(1941)....	1,149	28,760	5,054	545,884	16,582	435	24,639	3,048	494,967	15,898	1,584	53,399	8,102	1,040,851	32,480	4,494	358,870	54,669	7,933,586	255,147	
	(1940)....	1,174	28,958	4,820	500,040	15,019	449	25,108	3,021	463,654	15,686	1,623	54,066	7,841	963,694	30,735	4,524	352,556	51,380	7,218,544	241,499	
	(1939)....	1,190	29,879	4,756	501,860	14,955	456	26,496	2,989	456,759	16,154	1,646	56,375	7,745	958,619	31,109	4,486	349,880	49,160	7,144,869	232,435	
	(1938)....	1,188	30,193	4,557	495,553	15,255	403	26,550	3,236	470,136	15,630	1,681	56,743	7,793	965,689	30,885	4,438	346,244	47,636	6,813,795	229,019	
	(1937)....	1,183	29,957	4,766	508,359	15,458	530	28,085	3,516	507,077	16,477	1,713	58,042	8,282	1,015,436	31,935	4,406	335,799	46,644	6,711,592	225,556	
	(1936)....	1,204	28,496	4,356	437,797	13,672	550	28,511	3,629	497,457	16,462	1,754	57,007	7,985	935,254	30,134	4,465	332,881	45,583	6,191,026	211,681	
	(1935)....	1,255	29,913	4,384	413,997	14,212	627	31,916	4,357	532,590	18,697	1,882	64,859	8,741	946,587	32,909	4,522	333,427	44,893	5,424,102	200,589	
	(1934)....	1,310	29,429	4,391	366,313	12,046	629	33,072	4,038	458,303	15,985	1,939	62,501	8,429	824,616	28,031	4,585	330,213	44,680	4,988,351	185,098	
	(1933)....	1,435	33,385	4,962	381,861	13,746											4,661	332,573	44,649	4,882,444	184,197	
	(1932)....	1,522	25,759	5,094	428,256	16,309											4,758	334,987	44,572	5,178,598	198,277	
	(1931)....	1,560	36,761	5,352	459,184	17,912											4,797	332,591	44,232	5,322,898	206,095	
	(1930)....	1,620	38,557	5,233	....	19,948											4,907	336,143	43,281	....	212,645	
	(1929)....	1,611	37,977	5,212	....	20,604											4,870	324,596	41,877	....	209,881	
	(1928)....	1,699	39,710	4,843	....	......											5,039	325,500	37,641	....	....	
	(1927)....	1,682	39,118	.....	....	21,779											4,998	308,149	......	....	201,675	

TABLE 2.—HOSPITAL FACILITIES BY STATES AND BY TYPE OF SERVICE (Continued on next page)

Marginal No.		General Hospitals	General Beds	General Bassinets	General Patients Admitted	General Average Census	Nervous and Mental Hospitals	Nervous and Mental Beds	Nervous and Mental Bassinets	Nervous and Mental Patients Admitted	Nervous and Mental Average Census
1	Alabama	88	8,100	1,324	259,517	[illegible]	7	[illegible]	6	8,331	10,866
2	Arizona	53	3,963	591	105,771	[illegible]	2	[illegible]	..	954	1,568
3	Arkansas	65	5,359	812	150,223	[illegible]	2	[illegible]	..	3,921	6,657
4	California	271	55,091	5,049	1,246,705	[illegible]	44	[illegible]	..	29,699	45,898
5	Colorado	76	10,597	991	201,336	[illegible]	9	[illegible]	..	5,181	7,326
6	Connecticut	37	7,542	1,262	242,688	[illegible]	15	[illegible]	6	5,415	12,307
7	Delaware	9	1,509	235	40,196	[illegible]	3	[illegible]	..	1,090	2,205
8	District of Columbia	16	6,671	727	140,903	[illegible]	2	[illegible]	3	1,484	7,427
9	Florida	114	11,769	1,707	306,597	[illegible]	8	[illegible]	5	4,951	7,455
10	Georgia	107	10,348	1,481	333,820	[illegible]	7	[illegible]	7	7,519	12,377
11	Idaho	45	2,297	530	74,364	[illegible]	3	[illegible]	..	791	1,851
12	Illinois	227	37,989	5,259	1,048,112	[illegible]	31	[illegible]	14	20,914	50,699
13	Indiana	102	13,228	2,160	403,931	[illegible]	14	[illegible]	..	[illegible]	14,986
14	Iowa	107	9,091	1,628	295,089	[illegible]	12	[illegible]	5	[illegible]	11,404
15	Kansas	113	9,277	1,462	243,609	[illegible]	7	[illegible]	..	[illegible]	8,135
16	Kentucky	86	10,135	1,301	275,239	[illegible]	11	[illegible]	1	[illegible]	10,480
17	Louisiana	101	12,279	1,486	348,440	[illegible]	6	[illegible]	1	[illegible]	8,322
18	Maine	43	2,972	579	87,975	[illegible]	5	[illegible]	2	[illegible]	4,886
19	Maryland	48	12,299	1,288	244,694	[illegible]	15	[illegible]	..	[illegible]	12,079
20	Massachusetts	141	25,961	3,235	545,104	[illegible]	32	[illegible]	10	[illegible]	33,524
21	Michigan	178	25,070	3,778	735,557	[illegible]	23	[illegible]	3	[illegible]	30,675
22	Minnesota	164	14,178	2,260	413,055	[illegible]	17	[illegible]	20	[illegible]	13,082
23	Mississippi	85	5,656	842	177,163	[illegible]	6	[illegible]	..	[illegible]	6,261
24	Missouri	112	14,768	2,196	393,056	[illegible]	15	[illegible]	2	[illegible]	15,296
25	Montana	52	3,605	618	95,708	[illegible]	1	[illegible]	..	[illegible]	1,930
26	Nebraska	98	6,491	1,119	171,942	[illegible]	5	[illegible]	2	[illegible]	6,463
27	Nevada	15	1,008	154	25,484	[illegible]	1	[illegible]	..	[illegible]	374
28	New Hampshire	33	2,652	495	71,123	[illegible]	2	[illegible]	..	[illegible]	3,285
29	New Jersey	86	16,868	2,617	468,644	[illegible]	22	[illegible]	2	[illegible]	25,578
30	New Mexico	36	2,194	435	64,587	[illegible]	4	[illegible]	..	[illegible]	1,232
31	New York	314	73,819	8,381	1,701,518	[illegible]	58	[illegible]	59	[illegible]	114,187
32	North Carolina	134	13,772	2,369	450,223	[illegible]	10	[illegible]	2	[illegible]	10,416
33	North Dakota	42	3,023	549	91,538	[illegible]	2	[illegible]	2	[illegible]	3,262
34	Ohio	153	26,206	4,131	826,541	[illegible]	28	[illegible]	1	[illegible]	34,370
35	Oklahoma	101	7,106	1,288	214,722	[illegible]	7	[illegible]	..	[illegible]	9,426
36	Oregon	61	5,531	980	183,787	[illegible]	6	[illegible]	1	[illegible]	5,332
37	Pennsylvania	230	45,034	6,666	1,117,912	[illegible]	39	[illegible]	..	[illegible]	49,207
38	Rhode Island	15	4,097	323	67,756	[illegible]	4	4,473	4	[illegible]	4,273
39	South Carolina	55	7,821	1,017	213,294	[illegible]	3	6,701	2	[illegible]	6,663
40	South Dakota	53	3,180	642	101,117	[illegible]	3	3,408	..	[illegible]	3,148
41	Tennessee	97	10,997	1,451	308,739	[illegible]	12	10,238	8	[illegible]	9,818
42	Texas	419	33,234	4,703	969,153	[illegible]	17	18,546	..	[illegible]	20,507
43	Utah	28	2,335	590	78,159	[illegible]	2	2,052	..	[illegible]	1,984
44	Vermont	23	1,744	327	50,477	[illegible]	3	2,287	..	[illegible]	2,440
45	Virginia	92	15,729	1,832	379,629	[illegible]	11	14,535	12	[illegible]	14,324
46	Washington	101	12,699	1,843	353,611	[illegible]	8	10,312	..	[illegible]	9,604
47	West Virginia	63	7,320	965	231,484	[illegible]	7	5,482	2	[illegible]	5,135
48	Wisconsin	140	14,894	2,545	455,546	[illegible]	42	17,590	10	[illegible]	17,010
49	Wyoming	28	1,769	282	53,983	1,065	3	1,818	..	[illegible]	7,757
	Totals (1951)	4,890	640,207	88,505	17,065,821	470,692	596	728,187	192	307,010	697,521
	(1950)	4,713	587,917	85,582	15,830,170	433,364	579	711,921	221	307,165	687,567
	(1949)	4,761	571,683	85,502	15,150,311	429,413	606	705,423	226	308,055	675,096
	(1948)	4,589	576,459	83,497	15,160,062	437,590	586	691,499	279	305,000	664,399
	(1947)	4,539	592,453	82,303	14,665,195	456,761	585	680,913	259	291,954	651,578
	(1946)	4,523	641,331	79,534	14,051,508	496,527	575	674,930	322	271,209	635,769
	(1945)	4,711	922,549	78,919	15,228,270	665,105	563	657,393	295	248,876	624,349
	(1944)	4,833	925,818	76,570	15,060,403	570,331	566	648,715	206	226,393	618,951
	(1943)	4,885	850,576	72,839	14,454,638	529,340	575	650,993	210	208,677	619,447
	(1942)	4,557	594,260	67,115	11,634,288	405,382	586	646,118	216	214,117	609,773
	(1941)	4,518	533,498	61,732	10,616,947	363,614	596	638,144	219	208,592	603,179
	(1940)	4,432	462,360	58,073	9,219,496	325,160	602	621,284	161	190,376	590,712
	(1939)	4,356	444,917	55,183	9,018,316	307,991	600	606,284	110	190,249	577,103
	(1938)	4,286	425,324	52,924	8,545,930	292,870	592	591,822	137	198,703	562,337
	(1937)	4,215	412,091	51,668	8,319,773	288,280	579	570,616	124	195,624	546,906
	(1936)	4,207	402,605	49,694	7,755,848	271,658	584	548,932	109	184,936	524,993
	(1935)	4,257	406,174	48,757	6,875,182	261,294	592	529,311	132	173,009	507,269
	(1934)	4,198	393,425	47,856	6,291,556	237,395	614	513,845	84	172,415	488,481

Marginal No.		Tuberculosis Hospitals	Tuberculosis Beds	Tuberculosis Bassinets	Tuberculosis Patients Admitted	Tuberculosis Average Census	Maternity Hospitals	Maternity Beds	Maternity Bassinets	Maternity Patients Admitted	Maternity Average Census
1	Alabama	7	673	1	1,188	642	1	45	20	143	32
2	Arizona	11	1,422	..	5,268	1,138	..	...	...	.....	...
3	Arkansas	2	1,558	..	2,096	1,515	..	...	...	.....	...
4	California	26	5,877	..	6,215	4,989	10	336	242	8,016	222
5	Colorado	8	903	..	735	681	2	89	21	387	17
6	Connecticut	6	1,527	..	1,808	1,390	..	...	...	.....	...
7	Delaware	2	182	..	159	167	..	...	...	.....	...
8	District of Columbia	1	617	..	490	567	2	149	121	6,916	110
9	Florida	6	1,670	..	1,535	1,225	3	72	64	2,285	55
10	Georgia	1	2,000	..	1,187	1,520	1	12	12	241	3
11	Idaho	1	70	..	55	69	1	10	12	82	2
12	Illinois	28	3,856	1	4,197	3,364	5	598	184	6,954	329
13	Indiana	10	1,482	..	1,449	1,324	..	...	...	.....	...
14	Iowa	5	733	..	580	630	2	86	38	228	53
15	Kansas	3	465	..	556	409	2	80	39	186	34
16	Kentucky	9	1,508	..	1,988	1,230	1	27	26	1,353	16
17	Louisiana	4	384	..	603	301	1	74	6	117	25
18	Maine	4	470	..	498	392	..	...	...	.....	...
19	Maryland	6	1,246	..	1,025	1,104	..	...	...	.....	...
20	Massachusetts	23	4,363	4	5,069	3,323	4	383	343	12,184	275
21	Michigan	23	4,911	80	10,681	4,294	2	80	80	2,068	47
22	Minnesota	12	1,740	..	1,529	1,423	3	99	80	2,855	38
23	Mississippi	1	457	1	449	411	..	...	...	.....	...
24	Missouri	7	2,622	1	3,890	2,163	7	353	305	6,160	227
25	Montana	1	225	..	215	196	..	...	...	.....	...
26	Nebraska	1	225	..	142	175	2	49	29	222	31
27	Nevada	..	...	..	...	...	..	...	...	.....	...
28	New Hampshire	2	133	..	160	122	..	...	...	.....	...
29	New Jersey	14	3,618	2	4,332	3,012	2	386	391	10,352	199
30	New Mexico	5	807	1	1,248	652	..	...	...	.....	...
31	New York	49	11,323	..	12,550	10,076	9	601	335	21,986	495
32	North Carolina	19	3,957	..	6,621	2,980	2	20	16	750	6
33	North Dakota	1	348	..	264	305	1	45	6	76	10
34	Ohio	24	4,443	..	3,688	3,739	9	180	178	7,209	113
35	Oklahoma	4	679	..	1,015	597	1	25	15	65	18
36	Oregon	4	480	..	706	425	1	14	12	148	7
37	Pennsylvania	16	4,906	..	4,598	3,844	7	404	113	2,137	289
38	Rhode Island	2	637	..	321	464	1	175	175	8,116	149
39	South Carolina	5	848	..	779	658	..	...	...	.....	...
40	South Dakota	2	319	..	412	223	..	...	...	.....	...
41	Tennessee	8	1,839	9	2,815	1,469	1	60	...	1,975	54
42	Texas	19	4,182	..	5,100	3,245	4	71	27	1,048	43
43	Utah	1	100	..	136	79	1	23	25	996	11
44	Vermont	2	118	..	161	115	..	...	...	.....	...
45	Virginia	7	1,360	..	1,261	1,217	..	...	...	.....	...
46	Washington	12	3,039	..	4,307	2,588	1	10	16	113	3
47	West Virginia	5	1,150	..	1,000	1,029	..	...	...	.....	...
48	Wisconsin	21	2,857	..	2,054	2,019	1	76	15	235	40
49	Wyoming	1	50	..	46	28	..	...	...	.....	...
	Totals (1951)	430	[illegible]	100	107,181	73,588	90	4,632	2,946	105,663	2,953
	(1950)	431	[illegible]	89	113,275	72,370	92	4,699	2,991	102,147	3,060
	(1949)	444	[illegible]	110	113,078	69,170	102	5,087	3,153	98,543	3,359
	(1948)	438	[illegible]	21	105,588	66,184	100	5,226	3,319	98,114	3,398
	(1947)	441	[illegible]	32	99,080	62,575	100	5,442	3,312	100,382	3,929
	(1946)	450	[illegible]	36	99,741	61,931	101	5,392	3,426	82,191	3,777
	(1945)	449	[illegible]	54	86,186	59,767	106	5,656	3,544	77,078	3,741
	(1944)	453	[illegible]	38	88,281	63,025	107	5,762	3,708	81,964	3,805
	(1943)	455	[illegible]	112	91,674	65,302	112	6,085	3,800	84,974	3,908
	(1942)	468	[illegible]	116	101,526	70,005	113	5,903	3,777	80,375	4,171
	(1941)	477	[illegible]	99	101,473	70,577	116	5,318	3,573	64,874	3,472
	(1940)	479	[illegible]	41	90,936	67,007	116	5,647	3,380	60,518	3,534
	(1939)	480	[illegible]	38	90,615	65,487	118	5,553	3,196	59,381	3,552
	(1938)	493	[illegible]	41	100,801	66,212	120	5,969	3,361	66,115	3,699
	(1937)	508	[illegible]	33	101,839	64,800	111	5,166	3,487	59,919	3,180
	(1936)	506	[illegible]	36	99,234	63,266	125	6,402	3,816	67,925	4,065
	(1935)	496	[illegible]	58	86,113	60,738	121	6,111	3,825	66,693	3,582
	(1934)	495	[illegible]	..	82,455	59,689	130	7,625	4,131	76,980	4,617

Marginal No.		Industrial Hospitals	Industrial Beds	Industrial Bassinets	Industrial Patients Admitted	Industrial Average Census	Eye, Ear, Nose and Throat Hospitals	Eye, Ear, Nose and Throat Beds	Eye, Ear, Nose and Throat Bassinets	Eye, Ear, Nose and Throat Patients Admitted	Eye, Ear, Nose and Throat Average Census	Marginal No.
1	Alabama	..	...	..	.....	...	..	...	..	.....	...	1
2	Arizona	..	...	..	.....	...	..	...	..	.....	...	2
3	Arkansas	2	275	..	6,136	138	..	...	..	.....	...	3
4	California	2	646	..	12,231	525	2	55	..	3,197	27	4
5	Colorado	1	8	..	324	2	..	...	..	.....	...	5
6	Connecticut	..	...	..	.....	...	..	...	..	.....	...	6
7	Delaware	..	...	..	.....	...	..	...	..	.....	...	7
8	District of Columbia	..	...	..	.....	...	1	100	..	6,135	60	8
9	Florida	..	...	..	.....	...	1	10	..	611	5	9
10	Georgia	2	140	..	4,065	89	1	25	..	2,565	20	10
11	Idaho	..	...	..	.....	...	..	...	..	.....	...	11
12	Illinois	2	113	..	2,999	70	3	191	..	4,528	107	12
13	Indiana	1	50	..	670	30	1	12	..	1,729	5	13
14	Iowa	..	...	..	.....	...	..	...	..	.....	...	14
15	Kansas	2	202	..	3,653	171	..	...	..	.....	...	15
16	Kentucky	1	90	..	3,199	52	..	...	..	.....	...	16
17	Louisiana	1	60	..	767	32	1	97	..	5,482	60	17
18	Maine	..	...	..	.....	...	..	...	..	.....	...	18
19	Maryland	..	...	..	.....	...	2	107	..	5,275	58	19
20	Massachusetts	..	...	..	.....	...	2	206	..	6,054	106	20
21	Michigan	2	59	..	1,519	28	1	15	..	336	1	21
22	Minnesota	..	...	..	.....	...	1	185	..	6,999	141	22
23	Mississippi	..	...	..	.....	...	..	...	..	.....	...	23
24	Missouri	3	444	..	10,459	313	1	65	..	520	45	24
25	Montana	1	85	..	2,114	57	1	16	..	1,007	3	25
26	Nebraska	..	...	..	.....	...	..	...	..	.....	...	26
27	Nevada	..	...	..	.....	...	..	...	..	.....	...	27
28	New Hampshire	..	...	..	.....	...	..	...	..	.....	...	28
29	New Jersey	..	...	..	.....	...	1	65	..	3,161	40	29
30	New Mexico	1	76	..	1,339	60	..	...	..	.....	...	30
31	New York	2	46	1	726	21	7	671	..	34,291	389	31
32	North Carolina	1	50	..	658	20	2	91	..	4,829	49	32
33	North Dakota	..	...	..	.....	...	..	...	..	.....	...	33
34	Ohio	1	18	..	173	4	..	...	..	.....	...	34
35	Oklahoma	..	...	..	.....	...	..	...	..	.....	...	35
36	Oregon	..	...	..	.....	...	..	...	..	.....	...	36
37	Pennsylvania	..	...	..	.....	...	5	318	..	11,775	239	37
38	Rhode Island	..	...	..	.....	...	..	...	..	.....	...	38
39	South Carolina	..	...	..	.....	...	1	15	..	439	4	39
40	South Dakota	..	...	..	.....	...	..	...	..	.....	...	40
41	Tennessee	..	...	..	.....	...	7	119	..	7,885	72	41
42	Texas	5	438	..	9,315	256	9	104	..	4,956	33	42
43	Utah	..	...	..	.....	...	..	...	..	.....	...	43
44	Vermont	..	...	..	.....	...	..	...	..	.....	...	44
45	Virginia	1	16	..	78	4	3	78	..	2,136	38	45
46	Washington	1	21	1	465	15	..	...	..	.....	...	46
47	West Virginia	..	...	..	.....	...	..	...	..	.....	...	47
48	Wisconsin	..	...	..	.....	...	..	...	..	.....	...	48
49	Wyoming	..	...	..	.....	...	..	...	..	.....	...	49
	Totals (1951)	32	2,837	2	60,951	1,890	53	2,595	..	111,516	1,502	
	(1950)	27	2,661	31	58,180	1,807	51	2,560	3	113,951	1,183	
	(1949)	33	2,945	1	60,159	1,925	52	2,512	14	118,605	1,538	
	(1948)	33	2,910	1	61,817	2,051	46	2,531	13	118,355	1,621	
	(1947)	33	2,914	..	57,110	1,869	44	2,534	13	116,563	1,553	
	(1946)	34	2,980	..	56,061	1,838	46	2,719	16	111,117	1,710	
	(1945)	36	2,963	..	58,394	1,817	42	2,661	8	108,531	1,015	
	(1944)	39	2,893	6	55,974	1,789	42	2,695	6	102,898	1,189	
	(1943)	41	3,226	2	61,219	1,920	40	2,121	6	99,918	1,322	
	(1942)	36	2,896	2	46,723	1,608	42	2,516	10	100,544	1,307	
	(1941)	39	2,960	14	49,201	1,602	41	2,502	4	97,013	1,388	
	(1940)	33	2,792	3	41,835	1,504	41	2,170	4	97,853	1,313	
	(1939)	40	3,215	5	45,085	1,622	41	2,467	..	99,201	1,329	
	(1938)	37	2,992	2	42,666	1,182	38	1,992	..	90,803	1,080	
	(1937)	36	2,835	..	41,028	1,519	39	1,916	3	95,211	1,115	
	(1936)	41	3,159	10	41,862	1,530	43	2,118	32	99,273	1,113	
	(1935)	52	3,121	11	41,132	1,570	44	2,263	11	97,181	1,089	
	(1934)	113	5,575	313	69,609	2,123	55	2,793	19	103,720	1,265	

TABLE 2.—HOSPITAL FACILITIES BY STATES AND BY TYPE OF SERVICE—(Continued)

Marginal No.		Children's					Orthopedic					Isolation					Convalescent and Rest					Hospital Departments of Institutions					All Other Hospitals					Totals					Marginal No.
		Hospitals	Beds	Bassinets	Patients Admitted	Average Census	Hospitals	Beds	Bassinets	Patients Admitted	Average Census	Hospitals	Beds	Bassinets	Patients Admitted	Average Census	Hospitals	Beds	Bassinets	Patients Admitted	Average Census	Hospitals	Beds	Bassinets	Patients Admitted	Average Census	Hospitals	Beds	Bassinets	Patients Admitted	Average Census	Hospitals	Beds	Bassinets	Patients Admitted	Average Census	
1	Alabama	1	65	..	1,843	51	1	100	..	330	40	..	.....	..	.....	...	1	16	..	284	8	5	167	1	3,282	39	..	.....	..	.....	.....	111	20,450	1,352	274,918	16,989	1
2	Arizona	..	...	..	.....	...	1	50	..	395	50	..	.....	..	.....	...	2	69	..	542	26	..	.....	..	.....	.....	..	.....	..	.....	.....	69	7,182	591	112,930	5,503	2
3	Arkansas	1	70	5	846	60	..	...	..	.....	...	1	900	7	10,764	197	..	.....	..	.....	...	..	.....	..	.....	.....	..	.....	..	.....	.....	73	15,041	824	173,986	11,977	3
4	California	4	455	1	15,043	330	3	178	..	2,723	152	1	16	..	156	4	13	513	..	2,372	393	8	956	1	9,603	619	1	100	..	51	99	385	113,044	5,293	1,336,314	94,993	4
5	Colorado	1	195	15	12,839	172	..	...	..	.....	...	..	.....	..	.....	...	..	.....	..	.....	...	5	147	..	1,705	36	1	33	..	150	25	103	19,745	1,027	222,657	15,810	5
6	Connecticut	..	...	..	.....	...	1	197	..	293	160	1	150	..	189	21	2	155	..	845	99	8	1,110	11	5,747	459	1	72	2	88	51	71	23,756	1,281	257,073	20,195	6
7	Delaware	..	...	..	.....	...	1	85	..	217	50	..	.....	..	.....	...	..	.....	..	.....	...	1	378	7	286	399	..	.....	..	.....	.....	16	4,384	242	41,978	3,852	7
8	District of Columbia	1	227	..	9,231	136	..	...	..	.....	...	..	.....	..	.....	...	1	30	10	120	30	3	1,008	..	2,037	777	1	180	..	49	180	28	16,497	861	167,395	15,318	8
9	Florida	2	159	..	2,409	98	2	200	..	532	120	1	300	3	5,012	156	2	115	..	647	53	2	90	..	1,704	12	1	62	..	63	36	141	22,600	1,779	326,346	16,957	9
10	Georgia	1	40	4	1,381	31	3	285	..	1,535	266	1	884	5	21,527	413	1	31	..	63	25	3	189	..	2,787	70	1	80	..	284	63	129	26,915	1,509	376,974	21,585	10
11	Idaho	..	...	..	.....	...	1	56	..	181	50	..	.....	..	.....	...	..	.....	..	.....	...	1	40	..	861	9	..	.....	..	.....	.....	52	4,451	542	76,334	3,286	11
12	Illinois	3	350	..	7,688	205	4	182	..	331	129	2	330	..	2,642	82	23	1,280	..	4,617	934	8	508	..	11,113	158	5	2,664	..	1,509	2,543	341	102,644	5,458	1,115,604	87,858	12
13	Indiana	1	100	6	524	27	..	...	..	.....	...	..	.....	..	.....	...	2	268	..	7,678	165	5	517	..	3,753	215	1	23	..	348	18	137	30,454	2,166	424,576	27,100	13
14	Iowa	..	...	..	.....	...	..	...	..	.....	...	1	30	1	251	5	1	18	..	38	11	3	260	..	1,366	154	..	.....	..	.....	.....	131	22,620	1,672	302,416	19,049	14
15	Kansas	..	...	..	.....	...	..	...	..	.....	...	1	120	..	3,836	91	..	.....	..	.....	...	6	381	1	4,343	118	1	25	..	180	10	134	19,177	1,502	257,541	15,683	15
16	Kentucky	1	75	..	1,549	42	2	125	..	1,433	117	..	.....	..	.....	...	1	50	..	139	33	2	86	..	598	36	1	100	..	23	98	116	23,579	1,328	298,227	19,404	16
17	Louisiana	..	...	..	.....	...	1	60	..	162	57	..	.....	..	.....	...	1	29	..	74	11	..	.....	..	.....	.....	2	550	..	1,561	407	118	22,594	1,493	360,729	17,728	17
18	Maine	..	...	..	.....	...	..	...	..	.....	...	..	.....	..	.....	...	1	17	..	4	15	..	.....	..	.....	.....	..	.....	..	.....	.....	53	8,718	581	92,050	7,440	18
19	Maryland	..	...	..	.....	...	2	205	..	777	160	..	.....	..	.....	...	2	110	..	291	81	3	226	..	998	193	4	765	..	371	516	82	26,517	1,288	261,090	22,825	19
20	Massachusetts	3	575	28	11,769	353	4	375	..	352	241	2	52	..	157	4	1	25	..	33	12	4	245	..	1,855	181	4	463	..	1,507	431	220	66,228	3,620	597,027	57,581	20
21	Michigan	1	200	..	5,291	129	2	146	..	721	124	2	130	..	912	57	10	547	..	1,762	378	10	1,084	5	9,665	827	2	108	..	2,083	66	256	64,650	3,946	783,263	56,513	21
22	Minnesota	1	75	..	3,162	66	3	334	..	890	303	..	.....	..	.....	...	4	317	..	1,230	296	6	228	..	2,344	111	1	69	..	58	68	212	31,316	2,360	439,884	26,024	22
23	Mississippi	..	...	..	.....	...	..	...	..	.....	...	2	775	10	20,482	401	..	.....	..	.....	...	..	.....	..	.....	.....	..	.....	..	.....	.....	94	13,550	853	202,391	10,434	23
24	Missouri	2	281	..	5,515	225	2	162	..	362	144	1	100	6	2,009	41	1	31	..	182	22	7	1,728	..	4,472	1,150	5	1,740	..	2,970	1,637	163	37,948	2,510	433,975	32,709	24
25	Montana	..	...	..	.....	...	1	26	25	363	25	..	.....	..	.....	...	..	.....	..	.....	...	..	.....	..	.....	.....	..	.....	..	.....	.....	57	5,914	643	100,193	4,686	25
26	Nebraska	1	96	..	3,315	72	2	140	..	900	91	..	.....	..	.....	...	1	55	..	35	54	2	52	..	1,294	24	..	.....	..	.....	.....	112	13,844	1,150	182,837	11,043	26
27	Nevada	..	...	..	.....	...	..	...	..	.....	...	..	.....	..	.....	...	..	.....	..	.....	...	..	.....	..	.....	.....	..	.....	..	.....	.....	16	1,408	154	25,651	1,039	27
28	New Hampshire	..	...	..	.....	...	..	...	..	.....	...	1	25	..	109	5	..	.....	..	.....	...	2	86	..	1,866	33	..	.....	..	.....	.....	40	6,322	495	74,292	5,177	28
29	New Jersey	1	87	3	3,063	38	8	451	..	3,237	311	4	2,504	..	2,399	2,058	9	593	..	1,714	477	9	418	3	3,734	280	2	435	..	160	371	158	51,923	3,018	508,923	44,901	29
30	New Mexico	..	...	..	.....	...	1	100	..	455	63	..	.....	..	.....	...	..	.....	..	.....	...	..	.....	..	.....	.....	..	.....	..	.....	.....	47	4,482	436	68,273	3,388	30
31	New York	4	433	20	2,699	340	11	1,131	..	5,369	948	5	995	..	9,976	684	12	1,429	..	7,740	907	24	5,434	40	22,980	4,521	16	4,498	..	12,326	4,607	511	220,831	8,836	1,868,844	193,618	31
32	North Carolina	1	50	..	1,699	21	2	280	..	694	215	1	150	..	3,080	70	1	25	..	100	15	2	209	..	2,233	86	1	40	..	63	32	176	29,879	2,387	475,839	23,194	32
33	North Dakota	..	...	..	.....	...	..	...	..	.....	...	..	.....	..	.....	...	..	.....	..	.....	...	..	.....	..	.....	.....	1	30	..	398	27	47	6,718	557	92,968	5,505	33
34	Ohio	3	516	..	19,622	286	3	180	..	636	111	..	.....	..	.....	...	9	407	1	3,668	209	9	569	..	6,749	195	4	1,081	..	672	995	243	69,685	4,311	883,321	60,824	34
35	Oklahoma	..	...	..	.....	...	2	118	..	2,241	105	..	.....	..	.....	...	..	.....	..	.....	...	4	183	..	3,124	38	..	.....	..	.....	.....	119	18,591	1,303	224,703	15,118	35
36	Oregon	..	...	..	.....	...	1	60	..	377	60	2	135	5	606	61	..	.....	..	.....	...	1	30	..	790	9	..	.....	..	.....	.....	76	11,759	998	188,955	9,907	36
37	Pennsylvania	5	583	..	13,896	410	5	566	..	796	450	4	895	12	2,883	362	9	510	..	2,460	435	13	1,061	..	6,518	798	10	853	..	3,935	671	343	107,104	6,791	1,181,545	91,022	37
38	Rhode Island	..	...	..	.....	...	..	...	..	.....	...	1	255	..	3,035	117	..	.....	..	.....	...	..	.....	..	.....	.....	1	72	..	18	72	24	9,709	502	81,008	8,142	38
39	South Carolina	..	...	..	.....	...	1	60	..	304	54	..	.....	..	.....	...	..	.....	..	.....	...	..	.....	..	.....	.....	..	.....	..	.....	.....	65	15,445	1,019	217,095	12,741	39
40	South Dakota	..	...	..	.....	...	..	...	..	.....	...	..	.....	..	.....	...	..	.....	..	.....	...	1	36	..	269	20	..	.....	..	.....	.....	59	7,243	642	102,654	5,718	40
41	Tennessee	1	75	25	2,921	75	3	155	..	697	125	..	.....	..	.....	...	1	135	..	616	61	4	796	..	2,621	593	1	30	..	85	17	135	24,474	1,493	331,655	20,612	41
42	Texas	3	213	4	3,682	115	2	100	..	661	82	2	465	10	8,120	202	6	183	..	596	130	7	500	..	5,576	178	4	312	..	2,557	208	527	58,348	4,744	1,020,969	47,692	42
43	Utah	1	33	..	135	32	1	58	..	59	29	..	.....	..	.....	...	..	.....	..	.....	...	..	.....	..	.....	.....	..	.....	..	.....	.....	34	4,601	615	79,979	3,661	43
44	Vermont	..	...	..	.....	...	..	...	..	.....	...	..	.....	..	.....	...	..	.....	..	.....	...	1	12	..	130	4	..	.....	..	.....	.....	29	4,161	327	51,698	3,796	44
45	Virginia	..	...	..	.....	...	2	137	..	742	96	..	.....	..	.....	...	..	.....	..	.....	...	4	233	..	3,550	60	..	.....	..	.....	.....	120	32,088	1,844	396,460	26,703	45
46	Washington	..	...	..	.....	...	2	185	..	3,175	150	..	.....	..	.....	...	..	.....	..	.....	...	3	228	..	2,297	90	2	270	..	2,621	252	133	26,794	1,860	370,725	21,468	46
47	West Virginia	..	...	..	.....	...	2	221	..	1,039	131	1	50	4	1,376	34	..	.....	..	.....	...	2	82	6	1,075	45	..	.....	..	.....	.....	80	14,305	977	241,267	12,114	47
48	Wisconsin	1	150	..	4,921	121	..	...	..	.....	...	3	255	..	1,505	29	3	124	..	207	102	5	598	..	1,089	561	3	119	4	297	87	219	36,663	2,574	473,825	31,021	48
49	Wyoming	..	...	..	.....	...	..	...	..	.....	...	..	.....	..	.....	...	..	.....	..	.....	...	..	.....	..	.....	.....	..	.....	..	.....	.....	32	3,637	282	51,761	2,850	49
	Totals (1951)	44	5,133	111	135,043	3,438	82	6,708	25	[illegible]	5,209	40	9,516	63	101,026	5,097	120	7,115	11	38,057	5,078	183	19,905	75	134,414	13,098	77	14,774	6	34,427	13,587	6,637	1,529,988	92,036	18,237,118	1,293,653	
	(1950)	44	5,087	138	129,784	3,401	86	6,963	25	[illegible]	5,526	44	8,554	77	135,877	4,036	113	6,415	4	33,860	4,529	178	18,547	30	123,854	11,806	72	15,842	6	40,027	13,828	6,430	1,456,912	89,200	17,023,513	1,212,777	
	(1949)	42	4,656	118	116,821	3,220	87	6,954	21	[illegible]	5,327	56	10,364	118	148,354	4,535	109	6,034	3	36,396	4,430	202	20,920	111	132,831	12,917	78	15,952	6	40,392	13,685	6,572	1,439,030	89,386	16,659,973	1,224,951	
	(1948)	39	4,530	105	112,699	3,148	85	6,924	16	[illegible]	5,033	61	12,073	116	220,776	5,681	97	6,516	20	37,242	4,689	189	23,361	177	126,235	15,047	72	9,468	2	41,821	8,107	6,335	1,423,520	87,596	16,422,774	1,217,154	
	(1947)	41	4,630	80	100,923	3,277	82	6,519	23	[illegible]	4,738	65	12,556	183	163,300	5,478	93	5,840	20	32,339	4,206	194	22,516	151	140,276	14,739	59	7,577	2	34,268	6,526	6,276	1,425,222	86,378	15,829,514	1,217,229	
	(1946)	42	4,490	110	96,026	3,257	82	6,518	19	[illegible]	4,700	70	11,497	220	146,836	5,249	97	6,579	30	32,608	3,852	202	21,253	128	144,664	13,566	58	7,808	4	34,231	7,278	6,280	1,468,714	84,145	15,153,452	1,239,151	
	(1945)	44	4,770	81	90,097	3,495	83	6,679	19	[illegible]	4,781	63	8,406	87	99,599	3,223	102	9,556	32	57,385	7,009	168	17,720	52	112,211	11,093	111	21,814	40	61,621	19,222	6,511	1,738,944	83,131	16,257,402	1,105,247	
	(1944)	44	4,459	39	85,243	3,096	84	6,864	10	[illegible]	4,673	61	8,300	67	48,387	2,864	109	13,825	34	61,548	7,993	216	24,484	97	153,057	15,927	57	6,252	10	43,265	5,531	6,611	1,729,945	80,791	16,036,818	1,299,171	
	(1943)	40	4,194	19	84,404	2,705	84	7,025	..	[illegible]	5,020	55	8,313	44	49,570	3,219	126	12,453	42	34,847	8,211	203	20,224	56	141,658	13,280	39	3,884	4	28,188	3,450	6,655	1,619,251	77,134	15,371,698	1,257,121	
	(1942)	43	4,314	44	84,759	2,908	79	7,313	29	[illegible]	5,516	52	6,279	33	37,936	2,087	139	9,793	40	35,929	8,041	194	18,532	64	145,865	12,300	36	3,501	2	27,370	2,840	6,315	1,383,827	71,148	12,545,610	1,126,028	
	(1941)	52	6,067	337	117,428	4,130	82	7,382	10	[illegible]	5,691	52	6,356	21	36,399	2,093	136	9,630	36	38,862	7,967	219	27,037	118	174,335	20,593	30	3,122	..	22,764	2,673	6,358	1,321,381	66,163	11,596,188	1,087,039	
	(1940)	46	4,781	137	92,234	3,263	81	7,662	15	[illegible]	5,858	57	7,350	25	40,513	3,114	142	8,721	35	36,594	6,776	226	21,702	62	156,436	15,318	33	3,230	..	23,463	2,582	6,291	1,226,245	61,939	10,087,518	1,026,171	
	(1939)	48	5,151	146	95,137	3,524	82	7,706	..	[illegible]	5,752	60	7,100	6	30,279	2,655	139	8,821	36	34,191	6,948	232	25,014	40	160,927	18,200	30	2,796	4	18,882	2,320	6,226	1,195,026	58,761	9,870,211	996,183	
	(1938)	52	5,410	115	93,420	3,761	75	7,125	..	[illegible]	5,620	51	6,145	17	34,017	2,511	121	5,846	34	36,265	4,305	235	21,808	112	142,714	14,730	63	10,925	4	36,165	7,069	6,166	1,161,380	56,717	9,421,075	965,706	
	(1937)	51	5,389	111	89,584	3,714	75	6,880	10	33,015	5,563	56	6,187	23	37,295	2,633	120	5,566	38	29,411	3,965	240	21,821	61	144,189	14,498	65	9,000	8	44,569	7,933	6,128	1,121,548	55,566	9,221,517	911,136	
	(1936)	52	5,279	150	89,916	3,422	71	6,333	10	30,499	5,127	61	6,896	84	37,053	2,886	130	6,039	38	32,504	4,101	282	25,213	299	157,227	17,831	84	10,033	17	50,608	8,428	6,189	1,096,721	51,225	8,616,885	908,516	
	(1935)	51	4,874	118	83,015	3,115	68	6,394	12	28,280	5,010	66	7,384	70	47,004	3,301	135	6,233	34	28,218	4,437	275	20,793	234	143,434	13,859	89	11,778	48	47,593	10,240	6,246	1,075,139	53,310	7,717,154	875,510	
	(1934)	58	5,386	146	87,571	3,629	69	6,389	12	28,076	5,003	71	7,430	45	38,949	2,934	125	5,456	45	24,083	3,580	312	21,982	310	135,272	14,590	94	8,132	35	36,730	6,462	6,334	1,018,101	53,026	7,117,116	830,098	

military hospitals as compared with 49,275 in 1950. The U. S. Public Health Service lists 10,293 beds, the Bureau of Indian Affairs, 3,259, and other federal hospitals, 8,937. Within the governmental division 25% of the beds are devoted to general hospitalization and 64% to psychiatric care. This is in marked contrast with the nongovernmental group, where the corresponding ratios are 85 and 4.9%. In the nongovernmental classification the church hospitals and other nonprofit associations constitute the largest group. These have a total capacity of 379,956 beds, whereas the individual and partnership hospitals report 27,527 and the corporations unrestricted as to profit 24,785.

When the hospitals are classified by type of service, it is found that the general hospitals have 640,207, or 42% of all beds. This represents an increase of 52,290 over the previous year, the governmental group having gained 41,109, the nongovernmental hospitals 11,181. While the advance was most prominent in the federal classification, there were also gains in all other divisions except the state hospitals and corporations unrestricted as to profit. At present the governmental general hospitals have 273,335 beds, the nongovernmental 366,872. As a group the psychiatric hospitals have the largest number of beds, now totaling 728,187, as compared with 711,921 in the previous year. Thus the present facilities in psychiatric institutions represent 48%, or nearly half, of all hospital beds. The nongovernmental classification, shown in table E, lists 21,263 psychiatric beds, whereas the governmental group reports 706,924, or 97% of the combined total. As indicated previously, the state psychiatric hospitals alone can accommodate 619,151. In the tuberculosis field the number of beds increased from 85,746 to 88,379, a total representing nearly 6% of the hospital beds. This constitutes a net gain of 2,633, with the expansion of 3,197 beds in the governmental group being partially offset by the loss of 564 in the nongovernmental hospitals. The remaining divisions shown in table D have 73,215 beds, or approximately 5% of the total. Reference should also be made to table G, which presents a full summary of hospital data, including detailed information on beds, bassinets, patients admitted, average daily census, and hospital births.

Number of Patients Admitted

Comparative Totals
1950: 17,023,513
1951: 18,237,118

The present report of 18,237,118 hospital admissions in 1951 is higher than any previous total compiled by the American Medical Association. Reference to table 2 will show that the number of admissions, which totaled 7,717,154 in 1935, had increased to 16,257,402 by 1945. Then, after a reduction to 15,153,452 in the following year, the hospital admissions again expanded to 15,829,514 in 1947, to 16,422,774 in 1948, to 16,659,973 in 1949, and to 17,023,513 in 1950. The tremendous increase of 1,213,605 admissions in the last year was shared by both the governmental and the nongovernmental divisions but was more pronounced in the latter group, which reported a net gain of 664,560, as compared with 549,045 in the governmental hospitals.

In the governmental section, which has 71.7% of the beds, the admissions totaled 4,866,415, or 26.7% of all patients admitted in 1951. These include 1,489,581 admissions in federal hospitals, 767,599 in state institutions, 1,066,562 in county hospitals, 1,257,575 in municipal hospitals, and 285,098 in the institutions operating under joint city and county control. In the federal division shown in table F the hospitals of the Veterans Administration reported 455,717 admissions, while those operated by the Army, Navy, and Air Force had a combined total of 875,368, as compared with 477,727 in the previous year.

The nongovernmental hospitals, with 28.3% of the bed capacity, received 13,370,703, or 73.3% of all patients admitted. Included in this group are 1,522,693 admissions in the proprietary hospitals, 5,152,206 in the church hospitals, and 6,695,804 in the other nonprofit associations. Together these nonprofit groups served 65% of the patients in 1951, whereas the proprietary hospitals admitted 8.3%.

When studied in relation to the type of service offered it will be found that the general hospitals admitted 17,065,821, or 93.6% of all patients reported in the present survey. In the governmental division the general admissions advanced from 3,700,597 to 4,292,253, whereas the nongovernmental general hospitals reported an increase from 12,129,573 to 12,773,568. Gains were shown in all control classifications but were most pronounced in the federal, church, and other nonprofit classifications.

The total of 307,010 admissions in the psychiatric hospitals is practically identical with the report of the previous year. While these institutions received only 1.7% of all admissions it should be noted that they maintained an average daily census of 697,521, which is greater than the combined patient load in all other registered hospitals. The average daily census, therefore, illustrates more fully the volume of service carried out in the psychiatric field, where longer periods of hospitalization are necessarily required.

In the tuberculosis hospitals the number of admissions decreased from 113,275 in 1950 to 107,181 in 1951. Reference should also be made to the other services in table D, where a decreased admission rate is particularly noticeable in the isolation hospitals as compared with the previous year. From the same table it may be shown that out of every thousand admissions 936 were assigned to general hospitals, 17 to psychiatric institutions, 6 to tuberculosis sanatoriums, 6 to maternity hospitals, 3 to industrial units, 6 to eye, ear, nose and throat, 7 to children's hospitals, 2 to orthopedic, 6 to isolation, 2 to convalescent units, 7 to hospital departments of institutions, and 2 to other hospitals. Comparative data will be found in tables 1 and 2 as well as in the other statistical compilations, but reference should also be made to the preceding Hospital Number of THE JOURNAL, May 12, 1951. Outpatients and hospital births are not included in the admission totals reported in the present survey.

Average Daily Census

Comparative Totals
1950: 1,242,777
1951: 1,293,653

As shown in the comparative totals of table 2, there was a continuous increase in the average daily census from 1935 to 1945. Although reductions occurred in the next three years, the patient load advanced thereafter to 1,224,951 in 1949, 1,242,777 in 1950 and 1,293,653 in 1951. Of the present total, which does not include newborn infants, an average of 973,072 patients were constantly under treatment in the governmental hospitals, as compared with 320,581 in the nongovernmental group. Increases occurred in all classifications shown in table C but were most pronounced in the governmental section, which can be credited with 75.2% of the total average census in all registered hospitals. In the nongovernmental division the principal gain occurred in the church and other nonprofit hospitals, where the combined census of 286,149 represents 22.1% of the total patient load compared with 34,432, or 2.7%, in the proprietary group.

In the general hospitals the highest average census was listed in 1945, when a total of 665,105 was reported. This declined to 429,443 in 1949 but increased to 433,364 in 1950 and 470,692 in 1951. At present, therefore, the general hospitals, with 42% of the total beds and 93.6% of all admissions, carry 36.4% of the daily patient load in the United States. In the last year the average census in the governmental hospitals advanced from 171,799 to 200,035, whereas the nongovernmental group reported an increase from 261,565 to 270,657. As shown in table G, the latter includes averages of 110,146 in the church hospitals, 138,354 in the other nonprofit associations, 11,062 in the individual and partnership classification, and 11,095 in the general hospitals designated as corporations unrestricted as to profit.

Again it may be shown that in the last year the psychiatric institutions had an average census of 697,521, or 53.9% of the total daily patient load in all registered hospitals. Reference to table E will show that the psychiatric service is chiefly under governmental control, inasmuch as the hospitals in this division reported an average daily census of 680,288 compared with 17,233 in the nongovernmental classification. In table G it may be observed also that the greatest load is in the state psychiatric hospitals, which maintain a constant average of 597,927. While the average census is high in this field, as a result of long periods of hospitalization, it should be mentioned again that the psychiatric hospitals, as a group, received only 1.7% of all patients admitted.

In the tuberculosis division, the average increased from 72,370 to 73,588, the latter representing 5.7% of the total hospital census. Here, as in the psychiatric group, the major responsibility falls on the governmental section, which reported a daily patient load of 65,684 as compared with 7,904 in the nongovernmental classification. The corresponding totals in the previous report were 63,868 and 8,502 respectively. The average census in other groups, representing 4% of the daily patient load, is shown in table D.

The average daily census of 1,293,653 represents a tremendous total of 472,183,345 patient days, including 355,171,280 in the governmental group and 117,012,065 in the nongovernmental division. When classified by type of service, however, the general hospitals show 171,802,580 days of patient care, the psychiatric institutions 254,595,165, the tuberculosis hospitals 26,859,620, and other units 18,925,980.

Table H.—*Percentage of Beds Occupied*

	1949	1950	1951
According to Ownership or Control:			
Federal	79.5	77.8	77.3
State	94.2	95.1	94.5
County	83.0	83.6	82.8
City	81.0	82.9	78.6
City-county	74.9	78.4	78.2
Total governmental	89.3	89.8	88.6
Church	78.2	76.6	76.3
Other nonprofit associations	74.7	74.5	74.6
Total nonprofit	76.1	75.4	75.3
Individual and partnership	60.5	60.0	60.1
Corporations (profit unrestricted)	70.7	70.7	72.1
Total proprietary	65.1	65.2	65.8
Total nongovernmental	74.7	74.1	74.1
According to Type of Service:			
General	74.7	73.7	73.5
Nervous and mental	95.7	96.6	95.8
Tuberculosis	83.2	84.4	83.3
Maternity	66.0	65.1	63.8
Industrial	65.4	67.9	66.6
Eye, ear, nose and throat	60.5	57.9	57.9
Children's	69.2	66.9	67.0
Orthopedic	76.6	79.4	77.7
Isolation	43.8	47.2	53.6
Convalescent and rest	73.4	70.6	71.4
Hospital departments of institutions	61.7	63.7	65.8
All other hospitals	85.8	87.3	92.0
Total all hospitals	85.1	85.3	84.5

Table J.—*Average Length of Stay Per Patient in General Hospitals, 1949, 1950 and 1951*

	1949	1950	1951
According to Ownership or Control:			
Federal	25.8 days	26.5 days	25.5 days
State	15.4 days	15.0 days	14.6 days
County	14.8 days	13.9 days	13.6 days
City	12.5 days	12.6 days	12.4 days
City-county	11.8 days	11.3 days	10.4 days
All governmental general	17.2 days	16.9 days	17.0 days
Church	8.3 days	8.0 days	7.9 days
Other nonprofit associations	8.3 days	8.2 days	8.0 days
All nonprofit general	8.3 days	8.1 days	8.0 days
Individual and partnership	5.4 days	5.4 days	5.3 days
Corporations (profit unrestricted)	6.4 days	6.5 days	6.3 days
All proprietary general	5.9 days	5.9 days	5.8 days
All nongovernmental general	8.0 days	7.9 days	7.7 days
All general hospitals	10.1 days	10.0 days	10.1 days

Percentage of Beds Occupied

Comparative Totals
1950: 85.3
1951: 84.5

Table H presents information on bed occupancy rates for the past three years based on hospital control and type of service. Compared with 1950 the present survey shows a reduction from 85.3 to 84.5% for all registered hospitals; however, as a group, the nongovernmental hospitals remained at the previous level of 74.1%, whereas the governmental section, with its higher occupancy rate, was reduced from 89.8 to 88.6%. Following the pattern of previous years, the state hospitals again maintain the highest occupancy of 94.5%, which reflects in a large measure the prolonged hospitalization of psychiatric patients. The federal rate was reduced from 77.8 to 77.3%, and there were similar reductions in the county, municipal, and city-county groups. In the nongovernmental hospitals the increase, which occurred in the individual and partnership group and the corporations unrestricted as to profit, was offset by the loss recorded in the total nonprofit division.

When the hospitals are classified by type of service there is a greater variation in the percentage of beds occupied. The isolation hospitals, which respond mainly to seasonal demands, reported only 53.6%, whereas the psychiatric hospital group had an average occupancy of 95.8. In the tuberculosis field the rate declined from 84.4 to 83.3, and there was a similar reduction in the general hospitals from 73.7 to 73.5%. In this connection, it should be noted that an average occupancy of 80 to 85% is generally regarded as the maximum limit of operating efficiency in general hospitals.

Average Length of Stay

In the general hospitals the average length of stay per patient in 1951 was 10.1 days, based on the reported total of 17,065,821 admissions and 171,802,580 patient days. Reduced totals occurred in all classifications shown in table J, but the governmental general hospitals, as a group, had an average stay of 17.0 days compared with 7.7 days in the nongovernmental hospitals. The average period of hospitalization, therefore, is more than twice as long in the governmental division, where the federal general hospitals reported 25.5 days, the state group 14.6, the county hospitals 13.6, the municipal 12.4, and the city-county 10.4. In the proprietary hospitals the average length of stay is only 5.8 days, whereas the general hospitals in the church and other nonprofit classification report 8.0 days. Further reference should be made to table J, which offers comparative data for the past three years.

The present average of 10.1 days for all general hospitals may be compared with 10.0 in 1950, 10.1 in 1949, 10.5 in 1948, 11.4 in 1947, 12.9 in 1946, and 15.9 in 1945. Since 1945, therefore, the length of stay has been reduced by 5.8 days. This reduction applied to the present total of 17,065,821 admissions in the general hospital group would represent an actual saving of 98,981,762 days of hospital care.

Births in Hospitals

Comparative Totals
1950: 2,815,806
1951: 2,999,371

The present total of 2,999,371 births, as shown in table K, sets a new record in the hospital field. The previous high was in 1947, when 2,837,139 were reported in the hospitals registered by the American Medical Association. The 1948 total of 2,794,281 was increased to 2,820,791 in 1949, but in 1950 the number of births reported was 2,815,806. Compared with 1950 the present report shows a net gain of 183,565, including 70,140 in the governmental division and 113,425 in the nongovernmental group. Reference to table K will show that increases occurred in all hospital divisions classified according to ownership or control. The governmental hospitals reported 572,292, or 19.1% of the total, whereas the nongovernmental had 2,427,079, or 80.9%. Included in the latter group are 245,671 births in the proprietary hospitals and 2,181,408 in the church and other nonprofit associations.

In the general hospitals, the number of births increased in the last year from 2,739,212 to 2,923,509. This total, which represents 97.5% of all hospital births, includes 558,580 in the governmental general hospitals and 2,364,929 in the corresponding nongovernmental group. The maternity hospitals reported 71,343, an increase of 399 over the previous year. The other hospitals included in the service classification had a total of only 4,519. Further reference should be made to table K, which illustrates clearly the tremendous increase that has occurred in the utilization of hospital facilities for maternity care.

TABLE K.—*Births in Hospitals According to Ownership or Control and According to Type of Service*

	1929	1949	1950	1951
According to Ownership or Control:				
Federal	2,296	60,026	61,938	85,935
State	9,125	59,790	62,918	68,477
County	17,527	141,540	151,139	170,425
City	45,787	186,315	182,343	196,733
City-county	8,806	38,714	43,814	50,722
Total governmental	83,541	486,385	502,152	572,292
Church	209,726	944,610	949,955	983,760
Fraternal	1,730	......	......	......
Nonprofit associations	......	1,121,744	1,126,353	1,197,648
Industrial	4,327	......	......	......
Independent	283,136	......	......	......
Total nonprofit	......	2,066,354	2,076,308	2,181,408
Individual and partnership	39,436	153,947	128,101	134,539
Corporations (profit unrestricted)	......	114,105	109,245	111,132
Total proprietary	......	268,052	237,346	245,671
Total nongovernmental	538,355	2,334,406	2,313,654	2,427,079
According to Type of Service:				
General	566,177	2,744,268	2,739,212	2,923,509
Maternity	53,019	72,274	70,944	71,343
Children's	862	......	......	2
Hospital departments of institutions	277	175	341	238
All other hospitals	1,561	4,074	5,309	4,279
Total births in all hospitals	621,898	2,820,791	2,815,806	2,999,371

TABLE L.—*Hospital Births Classified by States*

	Births		Births
Alabama	43,298	Nebraska	29,467
Arizona	18,318	Nevada	2,976
	22,954	New Hampshire	11,558
	209,421	New Jersey	91,449
	32,027	New Mexico	11,577
Connecticut	41,115	New York	295,935
	7,360	North Carolina	73,855
	30,668	North Dakota	15,073
Florida	49,634	Ohio	178,122
Georgia	53,405	Oklahoma	34,820
Idaho	14,289	Oregon	32,910
Illinois	182,161	Pennsylvania	211,841
Indiana	89,957	Rhode Island	16,463
Iowa	51,977	South Carolina	31,510
Kansas	37,848	South Dakota	15,593
Kentucky	46,710	Tennessee	52,546
Louisiana	59,492	Texas	158,944
Maine	15,501	Utah	19,770
Maryland	46,887	Vermont	7,915
	93,977	Virginia	56,191
	147,903	Washington	53,777
	72,584	West Virginia	32,991
	24,224	Wisconsin	81,011
Missouri	68,689	Wyoming	6,586
Montana	13,191		
		Total	2,999,371

Professional Nursing Service

Comparative Totals

Graduate Nurses	Student Nurses
1950: 205,389	1950: 102,611
1951: 216,047	1951: 103,527

In the hospital survey of 1951, information was obtained on professional nursing personnel and schools of nursing education, as shown in tables M 1, M 2, and M 3.

in 1950, and 6,711 in 1951. In the latter group the governmental hospitals list 2,949 students, the nongovernmental 3,762. On further analysis it may be shown that the general hospitals have 4,838, the psychiatric units 1,058, the tuberculosis institutions 241, and other hospitals 574. Reference to table N 1 will show that schools of practical nursing are now represented in all but four states.

In 1950 the number of auxiliary personnel, not counting practical nurse students, totaled 297,310, including 49,880 practical nurses, 131,762 attendants, 64,634 nurses' aides, 26,491 ward maids, and 24,543 orderlies. An almost identical report of 297,466 was obtained in the 1951 survey, but there were differences in individual groups, as indicated by the following totals: practical nurses, 40,816, attendants 127,161, nurses' aides 76,091, ward maids 26,627, and orderlies 26,771. A further classification of the auxiliary nursing personnel by states, hospital control, and type of service will be found in tables N 1, N 2, and N 3.

TABLE N 1.—*Auxiliary Nursing Personnel and Schools of Practical Nursing (Classified by States)*

State	Schools of Practical Nursing	Practical Nurse Students	Practical Nurses Employed	Attendants	Nurses' Aides	Ward Maids	Orderlies
Alabama	4	109	616	1,355	1,670	531	540
Arizona	2	33	247	650	378	143	159
Arkansas	5	57	369	1,513	761	153	130
California	16	529	2,005	12,386	5,271	1,658	2,430
Colorado	8	148	388	2,314	1,079	150	198
Connecticut	5	81	280	1,685	954	510	428
Delaware	2	29	30	368	206	43	47
District of Columbia	2	62	213	2,238	700	302	276
Florida	5	136	865	1,248	1,307	402	648
Georgia	4	121	686	2,041	1,508	666	1,061
Idaho	14	229	247	299	244	93	26
Illinois	8	150	1,453	6,880	5,186	1,362	1,331
Indiana	4	80	783	1,547	2,385	616	297
Iowa	6	182	616	1,380	1,592	376	245
Kansas	1	6	296	1,735	1,864	258	203
Kentucky	2	65	781	1,847	1,261	230	376
Louisiana	4	130	660	1,726	1,347	578	414
Maine	..	...	107	636	280	191	51
Maryland	9	175	802	2,420	1,093	792	991
Massachusetts	17	274	465	7,256	1,558	1,795	1,121
Michigan	20	208	2,215	6,488	3,806	1,049	996
Minnesota	13	291	1,290	1,777	2,612	540	322
Mississippi	5	27	253	1,086	548	252	210
Missouri	8	228	1,199	3,530	2,362	644	412
Montana	2	10	202	301	432	80	55
Nebraska	1	21	341	1,227	1,116	295	132
Nevada	1	75	44	78	129	37	18
New Hampshire	..	...	137	530	133	177	92
New Jersey	3	67	1,061	3,267	1,626	1,212	860
New Mexico	1	8	106	415	318	68	60
New York	23	915	8,896	23,518	5,518	2,485	3,143
North Carolina	10	166	936	1,861	1,376	698	779
North Dakota	2	21	135	297	390	94	50
Ohio	7	135	1,004	5,474	5,907	1,532	867
Oklahoma	5	114	571	1,321	995	185	162
Oregon	3	36	556	499	1,221	216	71
Pennsylvania	12	218	1,247	6,593	3,677	1,664	2,183
Rhode Island	..	...	132	685	156	144	197
South Carolina	2	44	306	631	583	336	520
South Dakota	1	30	178	498	422	90	26
Tennessee	13	197	1,089	1,853	1,403	579	405
Texas	58	846	3,330	4,601	3,909	1,130	2,231
Utah	1	10	213	354	416	73	55
Vermont	2	31	72	388	106	65	24
Virginia	5	120	863	2,101	1,221	709	897
Washington	6	151	1,450	1,797	1,402	315	367
West Virginia	4	47	247	801	1,095	336	435
Wisconsin	8	90	808	3,184	2,291	759	212
Wyoming	..	...	26	449	187	14	12
Totals	334	6,711	40,816	127,161	76,091	26,627	26,771

Special Services

Of the 6,637 registered hospitals included in the present survey, 2,790 reported outpatient departments, 3,614 answered "None," and 233 did not reply. The federal hospitals listed 299 outpatient services, the other governmental institutions 807, the church and other nonprofit associations 1,296 and the proprietary hospitals 388. Outpatient departments were likewise reported in 1,864 general hospitals, 250 psychiatric institutions, 300 tuberculosis sanatoriums, 38 maternity hospitals, 31 industrial, 28 eye, ear, nose, and throat, 28 children's hospitals, 64 orthopedic, 126 departments of institutions, and 61 other units. On the basis of size the following distribution can be recorded: hospitals of 25 beds and under—328 outpatient departments, 26-50 beds—522, 51-100 beds—543, 101-200 beds—525, 201-300 beds—312, 301 beds and over—560.

TABLE N 2.—*Auxiliary Nursing Personnel and Schools of Practical Nursing (Classified by Control)*

Control	Schools of Practical Nursing	Practical Nurse Students	Practical Nurses Employed	Attendants	Nurses' Aides	Ward Maids	Orderlies
Governmental							
U. S. Army	2	126	18	4,387	285	311	1,727
U. S. Air Force	..	...	59	381	153	59	1,286
U: S. Navy	..	...	453	871	81	255	2,311
U. S. Public Health Service	2	17	108	1,289	222	95	43
Veterans Administration	1	10	101	23,850	1,618	497	338
Indian Affairs	1	30	54	309	71	133	54
Other Federal	1	53	172	1,299	7	112	147
Total Federal	7	236	965	32,386	2,437	1,462	5,936
State	43	1,477	3,872	66,654	4,947	1,890	2,487
County	29	581	3,718	8,598	5,815	2,191	2,846
City	23	538	4,273	8,279	4,369	2,611	2,324
City-county	6	117	551	392	1,197	488	940
Total other governmental	101	2,713	12,414	83,923	16,328	7,180	8,597
Total all governmental	108	2,919	13,379	116,309	18,765	8,642	14,533
Nongovernmental							
Church	59	1,191	7,099	2,326	25,105	7,729	3,314
Nonprofit associations	112	1,989	13,329	6,427	28,006	8,361	7,589
Individual and partnership	37	310	4,131	749	2,074	992	623
Corporations (profit unrestricted)	18	266	2,878	1,350	2,141	903	712
Total nongovernmental	226	3,762	27,437	10,852	57,326	17,985	12,238
Total all hospitals	334	6,711	40,816	127,161	76,091	26,627	26,771

TABLE N 3.—*Auxiliary Nursing Personnel and Schools of Practical Nursing (Classified by Type of Service)*

Type of Service	Schools of Practical Nursing	Practical Nurse Students	Practical Nurses Employed	Attendants	Nurses' Aides	Ward Maids	Orderlies
General	264	4,838	29,597	35,449	67,581	21,747	22,499
N & M	33	1,058	3,453	82,170	2,367	1,595	758
Tuberculosis	12	241	4,094	5,291	3,097	1,631	1,789
Maternity	2	50	313	230	445	287	40
Industrial	..	...	82	70	133	120	183
E. E. N. T.	..	...	211	55	201	83	132
Children's	8	92	109	116	681	195	46
Orthopedic	2	16	431	548	724	187	187
Isolation	..	...	112	362	58	240	138
Conv. and rest	4	81	569	159	321	159	105
Institutions	5	92	872	932	243	108	511
All other hospitals	4	243	970	1,779	240	225	383
Total all hospitals	334	6,711	40,816	127,161	76,091	26,627	26,771

A total of 5,506 hospitals reported laboratory departments, whereas 1,039 gave a negative answer and 92 did not respond. In this group active laboratory services are maintained in 373 federal hospitals, 1,338 other governmental units, 2,816 church and other nonprofit associations, and 978 proprietary hospitals. The general hospitals list 4,343 laboratory departments, the psychiatric institutions 402, the tuberculosis sanatoriums 354, the maternity hospitals 34, industrial 27, eye, ear, nose, and throat 33, children's units 35, orthopedic 48, isolation 25, convalescent 29, hospital departments of institutions 122, and other hospitals 54. The hospitals of 25 beds and under reported 790 laboratories, 26-50 beds—1,186, 51-100 beds—1,232, 101-200 beds—1,023, 201-300 beds—471, and those of 301 beds or more—804. The federal hospitals list 337 laboratories with physicians in charge, the other governmental units 920, the church and other nonprofit associations 2,313 and the proprietary hospitals 655. Most of the physicians are associated with general hospitals, which reported 3,364 departments under medical supervision compared with 299 in psychiatric institutions, 251 in tuberculosis sanatoriums, and 311 in other hospitals.

X-ray departments total 5,838, with 735 hospitals responding "No" and 64 not replying. Included in the present number are 382 federal hospitals, 1,446 other governmental institutions, 2,929 church and other nonprofit associations, and 1,081 proprietary hospitals. The following distribution occurs with reference to type of service: general hospitals 4,680 x-ray departments, psychiatric institutions 361, tuberculosis sanatoriums 396, maternity hospitals 26, industrial 32, eye, ear, nose and throat 33, children's units 35, orthopedic 63, isolation 20, convalescent 22, hospital departments of institutions 122, and all other hospitals 48. When classified by size it is found that hospitals of 25 beds and under have 985 x-ray departments, those of 26-50 beds, 1,274; 51-100 beds 1,268; 101-200 beds 1,030; 201-300 beds 465; 301 beds and over, 816. The general hospitals list 3,874 x-ray departments with physicians in charge, the psychiatric units 271, the tuberculosis institutions 305, and other hospitals 336. The control classification shows 350 federal departments under medical supervision, 1,038 other governmental institutions, 2,566 church and other nonprofit associations, and 832 proprietary hospitals.

General Practice Sections

In 1945 the American Medical Association established a Section on the General Practice of Medicine. This was followed in 1946 by a recommendation from the House of Delegates that appointments to general practice sections in hospitals be made on the merits and training of individual physicians, and that, as a further clarification, the establishment of such sections should not prevent the approval of hospitals for intern or residency training. This policy of extending hospital privileges on the basis of qualifications is in full accord with the standards of the Council on Medical Education and Hospitals, which declare that the medical staff should be composed of graduates in medicine who are properly qualified by training, licensure, and ethical standing and are proficient in the fields of practice to which they devote themselves. These standards were modified in 1947 to encourage the establishment of general practice sections, at which time it was further emphasized that "hospital staff appointments should depend on the *qualifications* of physicians to render proper care to hospitalized patients, as judged by the professional staff of the hospital, and not on certification or special society memberships."

To aid in the organization of medical staffs, the American Academy of General Practice has prepared and distributed a Manual on General Practice Departments in Hospitals. This not only contains valuable information on organizational procedure, but serves also as a useful guide in the assignment of hospital privileges, so that the general practitioner may have a better opportunity to discharge his clinical responsibilities in accordance with individual qualifications and demonstrated ability.

The following information obtained last year was again requested in the present survey: (1) Does staff organization include a department of General Practice? (2) Is it modeled after the Manual of the American Academy of General Practice? (3) Are staff privileges in specialty divisions open to qualified general practitioners? On analyzing the hospital data it was found that 1,660 general hospitals reported general practice sections compared with 1,654 in 1950. Of the present total, which represents 34% of all general hospitals, 323 are in the governmental classification and 1,337 in the nongovernmental group. Included in these divisions are 56 federal general hospitals, 11 state institutions, 146 county hospitals, 91 municipal, 19 city-county, 439 church hospitals, 586 other nonprofit associations, 197 individual and partnership units, and 115 corporations unrestricted as to profit. When the hospitals having general practice sections are classified by size the following distribution may be noted: 25 beds and under, 196; 26-50 beds, 458; 51-100 beds, 416; 101-200 beds, 359; 201-300 beds, 148; and 301 beds and over 83. These totals should be compared with the previous report published in THE JOURNAL, May 12, 1951, page 123.

The present report indicates also that 1,202 hospitals have organized their general practice sections in accordance with the Academy plan and that 1,358 have granted qualified general practitioners additional staff privileges in specialty divisions. The corresponding totals in 1950 were 1,075 and 1,333. The further classification of these hospitals by size and control follows in general the same distributional pattern indicated above. General practice sections are reported in all states and the District of Columbia, but the number varies from 2 in Delaware and Rhode Island to 115 in Texas. California reports 110 hospitals with general practice sections, Illinois 100, New York 83, Michigan 76, Ohio 75, Pennsylvania 62, North Carolina 58, and Minnesota 50. In 19 states the number varies from 25 to 49, while the remaining 20 states and District of Columbia report 2 to 24. At present 93 hospitals are approved by the American Medical Association for residency training in general practice.

Standard Nomenclature

The first official edition of the Standard Nomenclature of Disease was published in 1933, and two years later approximately 500 hospitals had adopted this method of classification. Later, when the Standard Nomenclature of Operations was added, in 1942, a total of 1,014 hospitals were reporting the use of standard procedures. This number, which increased to 1,660 the following year, has since expanded to 4,457 in 1950 and 4,748 in accordance with the present survey. A great advance has thus been accomplished in the establishment of a uniform classification, as 71.5% of the registered hospitals are now utilizing the Standard Nomenclature of Diseases and Operations. Included in the present total are 314 federal institutions, 422 state hospitals, 402 county, 243 municipal, 60 city-county, 890 church hospitals, 1,557 other nonprofit associations, 599 individual and partnership hospitals, and 261 corporations unrestricted as to profit. The Standard classification is likewise employed in 3,612 general hospitals, 427 psychiatric institutions, 291 tuberculosis sanatoriums, 39 maternity hospitals, 21 industrial, 35 eye, ear, nose, and throat, 33 children's units, 62 orthopedic, 20 isolation, 52 convalescent, 111 hospital departments of institutions, and 45 other hospitals. It is also of interest to show that in hospitals of 25 beds and under 717 record departments are utilizing standard procedures. Those of 26-50 beds have 962; 51-100 beds, 1,007; 101-200 beds, 893; 201-300 beds, 436; 301 beds and over 733. Of the 6,637 registered hospitals, 1,070 indicated that they do not follow the standard classification, whereas 819 did not reply.

The Standard Nomenclature has been officially endorsed by the American Medical Association, the American Hospital Association, the American College of Surgeons, and many other medical and surgical societies. As it is highly desirable that a uniform classification be achieved, it is strongly urged that the hospitals that are not included in the above group give serious consideration to the adoption of the Standard Nomenclature, which is suitable for universal use.

Schools of Medical Technology

The approval of schools for laboratory technicians was initially carried out by the American Society of Clinical Pathologists and its Board of Registry, established in 1928. In 1933 the Registry formulated minimum requirements for laboratory schools and published a list of approved training courses following the completion of a questionnaire survey. That same year the American Society of Clinical Pathologists, realizing the need for inspection, requested the Council on Medical Education and Hospitals to aid in the study of courses for the training of laboratory technicians. After a total of 196 schools located in all parts of the country had been visited by the Council's staff, new standards were formulated in collaboration with the Registry and the American Society of Clinical Pathologists. These Essentials of an Acceptable School for Clinical Laboratory Technicians were adopted by the Council on May 10, 1936, and approved by the House of Delegates of the American Medical Association on May 13, 1936. Revisions of the Essentials occurred in 1941, 1943, 1947, and 1949; in 1947 the title was changed to Essentials of an Acceptable School for Medical Technologists.

The first list of schools for medical technologists conforming to the standards adopted by the American Medical Association in 1936 was published Aug. 29 of that year. It contained the names of 96 schools, with an enrollment of 701 students. In subsequent years the number of approved schools increased to 152 in 1940, 268 in 1945, 467 in 1950, and has now reached a total of 496.

During the Atlantic City meeting of the American Medical Association in June 1949, the Council on Medical Education and Hospitals reviewed its functions and responsibilities in relation to the inspection and approval of technical schools. It was agreed that the Council should maintain supervision of the educational standards of technical schools and also continue to be the agency to accredit these schools. It was recognized, however, that with the growing number of technical schools it would not be possible for the staff of the Council to continue to be responsible for carrying out inspections. In conformity with the Council's request, therefore, a Conference on Medical Technology was held Sept. 10, 1949, and, after a careful consideration of the problems involved and the urgent need for closer supervision of the training programs in laboratory schools, it was the consensus that the American Society of Clinical Pathologists and the Council on Medical Education and Hospitals endeavor to develop a program utilizing voluntary regional inspectors to survey the approved schools of medical technology and review all new applications. To assist in carrying out such a plan a Board of Schools of Medical Technology was established by the American Society of Clinical Pathologists. As an initial step, the Board, in cooperation with the Council, instituted a questionnaire survey in August, 1950, and to date reports have been received from practically all of the 496 schools currently approved. From this material a preliminary evaluation has been made to determine the number of schools fully acceptable under the present standards and those requiring further assistance in the reorganization of individual training programs. It was recognized, however, that final evaluation would necessitate further investigation and, accordingly, the American Society of Clinical Pathologists at its meeting in Chicago, Oct. 17, 1951, authorized the Board of Schools of Medical Technology to develop an inspection program that would cover all the approved medical technology schools. While final arrangements have not been made, it is anticipated that volunteer regional inspectors will be employed. Inspection reports will first be reviewed by the Board of Schools of Medical Technology, but the final decision as to approval or disapproval will, as in the past, rest with the Council on Medical Education and Hospitals. The Board is also cooperating with the Council in the evaluation of new applications.

The great majority of the 496 approved schools of medical technology are conducted in the department of clinical pathology of the larger hospitals. In contrast with an enrollment of 701 in 1936, current reports indicate that 3,518 students are now in training, as compared with 3,312 in 1950 and 3,119 in 1949. The number of graduates reported for 1951 was 2,220, an increase of 209 over the previous year. Only 417 of the 496 approved schools are included in this last summary, however, as the remaining 79 schools failed to report graduates for 1951. This is due, in part, to the initiation of new programs, suspension of training programs pending reorganization of established courses, or the failure of applicants to satisfy prerequisite entrance requirements. During the past year, 30 schools received approval, and one course was discontinued. The minimum entrance requirement of two years' college work in a college or university accredited by a recognized standardizing association is in effect in 381 of the approved schools; 46 require a degree, 67 three years of college, and the remaining two schools specify two and one-half and three and one-half years.

The present revision of the approved list shows that an increasing number of colleges and universities are affiliated with hospital training programs in medical technology. In the past year 282 approved hospitals reported college or university affiliation, as compared with 250 in 1950. Basic sciences and the regular academic requirements occupy the first three years in college, the fourth year being given over to instruction and practice training in hospital laboratories with which the educational institutions are affiliated. This training, as a rule, leads to a degree of Bachelor of Science in Medical Technology.

Adherence to established standards is again noted in connection with the length of the training reported by individual schools. In this connection, 419 hospitals have reported a minimum of 12 months, whereas 77 offer courses of 13 to 25 months. A large majority of the training programs are open to men students.

Application for approval of a school for medical technologists should be made to the Council on Medical Education and Hospitals of the American Medical Association, 535 North Dearborn Street, Chicago 10, Ill. Forms will be supplied for this purpose on request. They should be completed by the hospital pathologist in cooperation with the administrator of the institution requesting approval. Inquiries regarding the registration of qualified medical technologists should be addressed to the Registry of Medical Technologists, 700 South Council Street, Muncie, Ind.

Schools for X-Ray Technicians

The approval of schools for x-ray technicians was originally carried out by the American Registry of X-Ray Technicians sponsored by the American College of Radiology and the American Society of X-Ray Technicians. In June, 1943, at the request of the Registry, a resolution was presented to the House of Delegates of the American Medical Association by the Section on Radiology, inviting the Association to establish standards, inspect schools, and publish lists of acceptable institutions. The resolution was adopted by the House of Delegates, and the Council on Medical Education and Hospitals was asked to carry out these functions. Essentials of an Acceptable School for X-Ray Technicians were subsequently prepared by the Council in cooperation with the Registry and the American College of Radiology. These were adopted by the House of Delegates in 1944. On Jan. 13, 1945, the Council published its first list of 112 approved schools, which reported a maximum enrollment of 478. Since that time the approved schools have increased to 310, and the number of students to 1,907.

At its meeting in Atlantic City, June 3, 1949, the Council on Medical Education and Hospitals recommended that a conference be held with the American College of Radiology to consider the need for further revision of the Council's standards and the establishment of a cooperative plan for the continued approval and inspection of x-ray schools. This meeting took place in Chicago Sept. 12, 1949. It was subsequently indicated by the American College of Radiology that state councilors would participate in the inspection of x-ray schools and that copies of their reports would be forwarded to the office of the Council. A survey form was prepared by the College, with the assistance of the Council.

The program of inspection by the College was placed in operation early in 1951, plans having been completed on March 19, 1951. It provided for a survey of individual schools by state or regional councilors of the College, an evaluation of all data by an advisory committee, a further review by the Board of Chancellors of the College, and final consideration by the Council on Medical Education and Hospitals. Briefly, the evaluation procedure concerns such items as the adequacy of didactic instruction, proper supervision of technical activities, desirable ratio of student technicians to instructors, satisfactory amount of teaching material, suitable hospital facilities, sufficient resources, and general conformity with present standards. The initial survey has now been completed, and the reports forwarded to the Council show that the great majority of the schools are operating in general conformity with the present standards. Minor deficiencies have been called to the attention of 29 schools, and there were only 6 that would seem to require a complete reorganization of their training programs. These have been informed of the existing deficiencies and will be reinspected within the year. Excellent cooperation was extended by the various schools, which in turn received valuable help and guidance from the regional inspectors. At a meeting of the Board of Chancellors of the American College of Radiology held in Chicago in September, 1951, a recommendation was adopted (1) that the College continue to inspect hospitals applying for x-ray approval and that such inspections be evaluated on the system already adopted; (2) that schools failing in certain essentials to meet requirements be reinspected within a year; and (3) that schools under new directorship again be surveyed. This program is in continuous operation and is giving valuable assistance to the Council.

During the past year 28 additional schools have been approved for the training of x-ray technicians, while one course was discontinued. This has increased the number of approved schools to 310, which report a maximum enrollment of 1,907 students, compared with 1,653 in 1950 and 1,447 in 1949. A total of 1,080 graduates were reported by 278 schools, an increase of 157 over the previous year. The minimum entrance requirement of four years of high school is in effect in 288 approved schools, the remaining 22 schools specifying one to three years of college training or an R. N. degree. A further analysis of the data submitted by the approved schools reveals that the duration of the curriculum in 145 schools is 12 months; 120 programs are organized on a 24 months' basis, as compared with 89 last year, while the length of training in the remaining 45 schools varies from 15 months to four years.

The Essentials specify that acceptable schools may be conducted by approved medical schools, general hospitals, or x-ray departments affiliated with a general hospital. Application for approval should be submitted to the Council on Medical Education on Hospitals, 535 North Dearborn Street, Chicago 10, Ill. I [illegible] regarding registration of qualified technicians should be addressed to the American Registry of X-Ray Technicians, 2900 East Minnehaha Parkway, Minneapolis, Minn.

Schools of Physical Therapy

From 1928 to 1936 the approval of physical therapy schools was carried out by the American Physical Therapy Association. However, at the request of that organization a resolution was presented to the House of Delegates in 1934 asking that the American Medical Association undertake the inspection and approval of training programs in this field. The resolution was referred to the Board of Trustees, and the Council on Medical Education and Hospitals was requested by the Board to proceed with the survey. Inspections of 35 schools for physical therapists were subsequently made in connection with the regular field work of the Council's staff. Complete information was secured regarding the organization, faculty, entrance requirements, curriculum, physical facilities, records, and affiliations of each school. Essentials of an Acceptable School for Physical Therapy Technicians were prepared by the Council on Medical Education and Hospitals in collaboration with the Council on Physical Medicine of the American Medical Association, the American Congress of Physical Medicine, and the American Physical Therapy Association. These were adopted by the House of Delegates of the American Medical Association at the Kansas City session, May 9, 1936. Subsequent revisions were made in 1938, 1939, 1943, 1947 and 1949, and the present designation of Essentials of an Acceptable School of Physical Therapy was authorized in 1949.

The first list, published in August, 1936, contained the names of 13 schools considered acceptable in accordance with the existing standards. This number has since expanded to the present total of 31 schools. Reports received from these schools show a maximum enrollment of 723 students, an increase of 40 over the previous year. There were 498 graduates in the regular course and 93 in the graduate course, corresponding figures for 1950 being 394 and 96 respectively. Again it will be noted that courses are so arranged that various entrance requirements qualify students for training. These include graduation from an accredited school of nursing, graduation from an accredited school of physical education, or two or more years of college with satisfactory courses in biological and physical sciences. When high school graduates are admitted to courses sponsored by colleges or universities, a degree is granted after completion of the prescribed college and technical training. The tuition in all teaching centers closely parallels college fees.

In view of the continued shortage of ancillary personnel in physical therapy, the Council on Medical Education and Hospitals was requested by the Council on Physical Medicine and Rehabilitation of the American Medical Association to encourage the development of additional courses in teaching hospitals affiliated with medical schools. Acting on this suggestion, the Council on Medical Education and Hospitals at its meeting in Cleveland, Dec. 4, 1950, voted that a letter be sent to each medical school calling attention to the need for further facilities for the training of physical therapists. From replies to this communication and subsequent studies and contacts it is apparent that a number of medical schools are considering the development of training courses in this field. Where educational programs are already in operation the schools are cognizant of the existing shortages and are prepared to maintain enrollments at the highest level consistent with good teaching.

Schools of physical therapy may be established in medical colleges and hospitals approved by the Council on Medical Education and Hospitals of the American Medical Association, or in colleges and universities affiliated with acceptable hospitals and accredited by the respective regional associations of colleges and secondary schools.

Application for approval of physical therapy schools should be made to the Council on Medical Education and Hospitals, 535 North Dearborn Street, Chicago 10, Ill. Forms will be supplied on request. Inquiries regarding the registration of qualified therapists should be addressed to the American Registry of Physical Therapists, 30 North Michigan Avenue, Chicago 10, Ill.

Schools of Occupational Therapy

In March, 1931, the American Occupational Therapy Association requested the American Medical Association to undertake the inspection and approval of occupational therapy schools. Two years later, in June, 1933, a resolution was presented to the House of Delegates requesting that plans be effected for the establishment of standards, ratings, and inspections of training schools in occupational therapy. This request was referred to the Board of Trustees and later submitted to the Council on Medical Education and Hospitals and the Council on Physical Medicine for consideration and investigation. Because of its experience in medical education and the investigation of medical schools, teaching hospitals, and technical training, the Council on Medical Education and Hospitals was asked to undertake a survey in this field. The inspection work was begun in November, 1933, and was carried out in conjunction with the other activities of the Council. Thirteen schools were visited, but only 10, including one Canadian school, were found to be in active operation. Following the completion of the inspection program, joint meetings were held with representatives present from the American Occupational Therapy Association, the Council on Physical Medicine, and the Council on Medical Education and Hospitals. These concerned chiefly the development of standards, which were adopted by the Council in February, 1935, and later ratified by the House of Delegates at the Atlantic City session of the American Medical Association the following June. The Essentials of an Acceptable School of Occupational Therapy were published in THE JOURNAL, May 4, 1935, Aug. 31, 1935, and Aug. 29, 1936. In the two year period that followed the adoption of the original standards, further studies were made to test the practicability and applicability of the Essentials. As further changes seemed desirable in relation to subjects and hours and the possible concentration of technical training in selected fields, a new revision was approved by the Council on Medical Education and Hospitals in

February, 1938. The revised Essentials were published in The Journal, March 25, 1938, together with a list of six approved schools, five in the United States and one in Canada.

The Essentials currently in use were adopted by the House of Delegates in December, 1949. Changes related chiefly to the organization of the faculty, medical direction of the clinical training program, and the planning of the school curriculum and were made with the assistance of the Council on Physical Medicine and Rehabilitation of the American Medical Association and the American Occupational Therapy Association.

In view of the continued shortage of ancillary personnel in occupational therapy, the Council on Medical Education and Hospitals was requested by the Council on Physical Medicine and Rehabilitation of the American Medical Association to encourage the development of additional courses in teaching hospitals affiliated with medical schools. Acting on this suggestion, the Council on Medical Education and Hospitals at its meeting in Cleveland, Dec. 4, 1950, voted that a letter be sent to each medical school calling attention to the need for further facilities for the training of occupational therapists. From replies to this communication and subsequent studies and contacts it is apparent that a number of medical schools are considering the development of training courses in this field. Where educational programs are already in operation the schools are cognizant of the existing shortages and are prepared to maintain enrollments at the highest level consistent with good teaching.

During the past year, one school of occupational therapy was added to the list of approved training courses, bringing the number of schools now meeting minimum standards to 25. The 24 schools previously approved reported 418 graduates in 1951, as compared with 377 in 1950. During the same 12 months' period the enrollments increased from 1,893 to 1,971. It should be noted that the training in some schools is on two levels, the duration of the course, entrance requirements and tuition varying with the type of educational program offered. There are 22 courses designed for high school graduates, who are expected to devote four to five academic years to complete the combined college and professional training. A college degree is specified as an entrance requirement in 13 courses.

Application for approval of occupational therapy schools should be made to the Council on Medical Education and Hospitals, 535 North Dearborn Street, Chicago 10, Ill. Forms will be sent on request. Inquiries regarding registration of qualified therapists should be addressed to the American Occupational Therapy Association, 33 West 42d Street, New York 18, N. Y.

Schools for Medical Record Librarians

At the request of the American Association of Medical Record Librarians a formal resolution was presented to the 1942 session of the House of Delegates asking that the American Medical Association assume responsibility for the approval of schools for medical record librarians. Favorable action on the resolution granted the Council on Medical Education and Hospitals authority to establish standards, inspect training programs, and publish lists of approved schools. Minimum essentials were formulated with the assistance of the American Association of Medical Record Librarians after all existing schools were inspected. These Essentials were officially accepted by the House of Delegates in June, 1943, and immediately thereafter the first list of 10 approved schools was published. Subsequent revisions of the Council's standards were made in 1945 and 1949, and additional changes are under consideration at the present time, particularly in relation to faculty requirements, the qualifications for school directors, and further clarification of the practical phase of the training program.

Since the publication of the initial list the training courses have continued to expand, until at present 21 schools hold official Council recognition. These have a maximum enrollment of 176, as compared with 157 the previous year. Eleven of the 21 approved schools are affiliated with colleges or universities, and degrees are offered by 5 schools. However, fewer graduates were reported the past year, the number dropping from 83 in 1950 to 58 the last 12 months. The course of training is 12 months in 17 schools and 4 years in the remaining 4 schools. Entrance requirements of the approved schools are designed for high school graduates in four instances, these training programs being integrated with a four year college curriculum. Other courses are open to students having completed two and three years of college or acceptable nurse training. One school limits its enrollment to college graduates.

Application for approval should be made to the Council on Medical Education and Hospitals of the American Medical Association, 535 North Dearborn Street, Chicago 10, Ill. Special forms will be supplied for this purpose, and when the required information has been received the proposed training program will be reviewed in collaboration with the Council on Education of the American Association of Medical Record Librarians. The institutions applying for Council approval will, in all instances, receive full information and every possible assistance in the planning and development of training programs in accordance with present standards. Inquiries regarding the registration of qualified medical record librarians should be addressed to the American Association of Medical Record Librarians, 510 North Dearborn Street, Chicago 10, Ill.

Lists of Technical Schools

The lists of hospitals and technical schools included in The Journal in previous years have been revised and published as a separate supplement. In the individual fields of medical technology, x-ray technique, physical therapy, occupational therapy, and medical record library science full information is given with reference to the name and location of each school, college affiliations, directors of schools, entrance requirements, length of training, number of students, and annual tuition. These lists, which contain the names of all technical schools currently approved by the Council on Medical Education and Hospitals of the American [illegible] Association, [illegible] be given wide distribution, [illegible] ional copies [illegible] able on request.

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LIST OF REGISTERED HOSPITALS

The list of hospitals published in THE JOURNAL in previous years is not included in the present issue. It has been printed as a separate supplement, however, and will be distributed to all hospitals, medical schools, state medical associations, editors of state medical journals, state boards of medical examiners, state and national hospital organizations, state health officers, state boards of nurse examiners, and other agencies associated with hospital services.

Copies of the hospital list are also available to individual physicians and other subscribers to THE JOURNAL and may be obtained by communicating with the Council on Medical Education and Hospitals of the American Medical Association.

HOSPITAL SERVICE IN THE UNITED STATES

The annual hospital report of the Council on Medical Education and Hospitals published in this issue of THE JOURNAL shows again a continued increase in the utilization of hospital service in the United States. In 1951 the 6,637 hospitals registered by the American Medical Association set a new record with 18,237,118 patients admitted. This number not only represents a net increase of 1,213,605 in the last 12 months but also constitutes a far higher total than has been reported in previous years. The tremendous increase in hospital admissions in the last year was shared by both the governmental and the nongovernmental divisions but was more pronounced in the latter group, which reported a net gain of 664,560, as compared with 549,045 in the governmental hospitals. It is also shown in the present report that the nongovernmental hospitals received 13,370,703, or 73.3% of all patients admitted, whereas the governmental hospital group had 4,866,415, or 26.7%. These totals do not include 2,999,371 hospital births, which exceed by a considerable margin the previous record of 2,837,139 in 1947.

Again the greatest volume of service was reported in the general hospitals, which had an increase of 1,235,651 patients in 1951. These institutions, now totaling 4,890, listed 17,065,821, or 93.6% of all patients admitted and 2,925,509, or 97.5% of the hospital births. They also maintained throughout the year an average daily census of 470,692, or 36.4% of the daily patient load in all registered hospitals. The present total of 307,010 admissions in the psychiatric hospitals is practically identical with the report of the previous year. While this is only 1.7% of all patients admitted, the average daily census of 697,521 is the highest ever recorded in the psychiatric field and represents a total greater than the combined census of all other hospital groups. It can also be shown that the hospitalization of psychiatric patients is mainly under governmental control, inasmuch as the hospitals in this division had an average census of 680,288, as compared with 17,233 in the nongovernmental group. In the tuberculosis hospitals the number of admissions was reduced in the last year from 113,275 to 107,181. Here, as in the psychiatric field, the institutional care is largely a function of the governmental hospitals, which admitted 92,953 patients, while the nongovernmental units received only 14,228. In all registered hospitals the average daily census of 1,293,653 represents a total of 472,183,345 patient days, including 171,802,580 in the general hospital group, 254,595,165 in the psychiatric institutions, 26,859,620 in the tuberculosis hospitals, and 26,859,620 in other units. When classified by control the governmental division shows 355,171,280 days of patient care, whereas the nongovernmental hospitals had 117,012,065.

In 1951 the bed capacity of the registered hospitals increased by 73,076 and has now reached a total of 1,529,998, including 1,097,720 in governmental hospitals and 432,268 in the nongovernmental group. The general hospitals report 42% of all beds, the psychiatric institutions 48%, the tuberculosis hospitals 6%, and the other units approximately 5%. The average bed occupancy was reduced in the last year from 85.3 to 84.5%. The nongovernmental hospitals remained at the previous level of 74.1%, but the governmental division showed a reduction from 89.8 to 88.6%. In this group the state hospitals show the highest rate: 94.5%, which reflects in a large measure the prolonged hospitalization of psychiatric patients. A further reduction has also occurred in the general hospital field, which now shows an average occupancy of 73.5%. The average length of stay per patient in the general hospitals varies from 5.3 days in the individual and partnership hospitals to 25.5 days in the federal group. The church and other nonprofit hospitals reported 8.0 days, the city-county group 10.4, the municipal hospitals 12.4, the county institutions 13.6, and the state hospitals 14.6. The average for all general hospitals was 10.1 days as compared with 15.9 in 1945. This reduction of 5.8 days, applied to the present total of 17,065,821 admissions in the general hospital group, represents an actual saving of 98,981,762 days of hospital care.

The hospitals are continuing their full support of educational activities, with an increasing number of institutions participating in the training of medical students, interns, resident physicians, student nurses, technicians, and other hospital personnel. At present 865 hospitals are approved for internships and 1,131 for residency training. The 1,106 accredited schools of professional nursing reported a student enrollment of 103,527, while 334 additional schools for practical nurses have 6,711 students in training. In the technical fields approval has been extended to 496 schools of medical technology, 310 schools for x-ray technicians, 31 schools of physical therapy, 25 schools of occupational therapy, and 21 schools for medical record librarians. While the registered hospitals are primarily engaged in the care of the sick, they should also be commended for their generous support of the many educational functions essential to the maintenance of high standards and quality of hospital service.

TECHNICAL PERSONNEL

The present report on hospital service in the United States considers also the ancillary divisions of medical technology, x-ray technique, physical therapy, occupational therapy, and medical record library science. In all of these fields the Council on Medical Education and Hospitals has worked in close cooperation with the respective national organizations to develop standards for the training of technical personnel and to encourage the organization of suitable educational programs in hospitals, medical schools, colleges, and universities. While much progress has been made since the Council began its activities with technical schools in 1933, it is well recognized that personnel shortages exist in all fields and are continuing to increase in view of present emergency needs and the additional demands created by new and advanced methods of therapy and rehabilitation. Every effort, therefore, is being made to develop additional schools, to expand existing educational services when suitable facilities are available, and to intensify and coordinate the recruitment of student personnel on both a national and a local level.

A continued expansion of educational services has occurred in most of the technical fields. In the period 1947-1951, for example, the approved schools of medical technology increased from 337 to 496 and the annual number of graduates from 1,206 to 2,220. Courses in x-ray technique showed similar gains, with schools advancing from 211 to 310, while graduates increased from 499 to 1,080. The field of medical record science was represented by 12 schools and 63 graduates in 1947, whereas the present survey shows totals of 21 and 58 respectively. In occupational therapy, where the present report lists 25 schools and 418 graduates, there has been relatively little change in recent years; however, in physical therapy the approved schools advanced from 25 to 31 and the number of graduates from 403 to 591. The Council is receiving full cooperation in the standardization of technical training programs. The American College of Radiology has, in the last year, completed a survey of the approved x-ray schools and is continuing to assist the Council in the further inspection of individual schools and in the evaluation of new applications. A similar program has been developed in medical technology, where field investigations and the evaluation of new schools will be accomplished through the cooperation of the Board of Schools of Medical Technology of the American Society of Clinical Pathologists. The American Physical Therapy Association, the American Occupational Therapy Association, and the American Association of Medical Record Librarians are also giving every assistance in their respective fields.

ERADICATION OF MALARIA

The introduction of insecticides, such as DDT, has initiated a new stage in the history of malaria. The effect of the residual sprays with toxicants of various types has demonstrated the economic feasibility of nationwide malaria eradication. There are indications that in some countries, particularly in the United States, the epidemiology of malaria has been greatly modified.

Russell,[1] in a recent review, stresses that although these local victories are important they have not yet greatly reduced the total world incidence of malaria. Exact data on its incidence do not exist, since only a small number of cases are reported officially. Russell estimates that among the world's total population of 2,378,000,000 there occur annually some 350,000,000 cases of malarial fevers, with a mortality rate of about 1%. These figures offer a fair idea of the magnitude of the task of eradicating the disease. Malaria has always been one of the major scourges of the human race. Malaria was an important factor in the decline of moral and intellectual vigor that took place in Greece between 300 and 500 B. C. In India, it is today the major cause of poverty and of lowered physical and intellectual standards.

In the United States the decline in the incidence of malaria began about 1875; however, as late as 1915, the U. S. Public Health Service estimated, on the basis of a survey of 12 southern states, a million cases of malaria annually among a population of 25 million. In 1949 there appeared to be 19 primary cases and in 1950 only 7, in 13 southern states.

In speculating on the causes of the recession of malaria in the United States, Russell calls attention to the fact that there has been no significant change in the invasive properties of the parasite, the vectorial powers of the mosquito, or the immune defenses of the population. He presumes, therefore, that there must have been a reduction in the numbers of the vector, Anopheles quadrimaculatus. Many factors have contributed to the diminution in the numbers of the mosquitos. As pointed out in an earlier editorial in THE JOURNAL (Aug. 25, 1951), land improvements, extensive antimosquito drainage since 1915, and the more recent introduction of residual spraying with insecticides are some of these.

In the over-all problem of malaria eradication, vector reduction could be only one factor. Other factors, suggested by Russell, are the economic advance of the South, permitting better housing and education, greater use of physicians, hospitals, therapeutics, and prophylactic drugs, insecticides, screening, and other antimosquito measures.

The recent advances in the campaign for control of malaria give rise to new questions. Will anopheline resistance to residual insecticides become a significant factor; is malaria control advisable in holoendemic areas where the population has strong tolerance to the disease; and is malaria control advisable in areas that now are or that may be overpopulated? As to the holoendemic areas it is logical to suppose that discontinuance of efforts at control could be followed by epidemics after the community has lost its tolerance. The subject of increased populations belongs in a larger domain of human effort and is the concern of social scientists, economists, and agriculturists. Control of overpopulation by maintenance of a disease would be contrary to human rights.

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[1] Russell, P. F.: The Present Status of Malaria in the World, Am. J. Trop. Med. 1: 111-123 (Jan.) 1952.

RELATIONSHIP BETWEEN INOCULATIONS AND POLIOMYELITIS

The State and Territorial Health Officers Association requested the U. S. Public Health Service to sponsor a study and issue a clarifying statement on the possible relation between various types of inoculation and poliomyelitis. Subsequently, the Public Health Service, on March 14, 1952, sponsored a meeting of 42 poliomyelitis investigators, epidemiologists, pediatricians, allergists, and health officers. The National Foundation for Infantile Paralysis participated in the conference and helped in planning it.

The conference voted unanimously in favor of the conclusions contained in the following statement, which has been accepted by the Public Health Service and is being transmitted to official health agencies, to the medical profession, and to the public:

"There is no definite evidence that an increase in the number of cases of poliomyelitis has occurred as a result of injections of vaccines, drugs, and other medicinal agents. There is evidence that injections for the prevention of diphtheria, whooping cough and possibly tetanus, when given during an epidemic of poliomyelitis, may, on rare occasions, localize the paralysis in the inoculated arm or leg. There is no satisfactory evidence that other types of injections have any effect on the localization, frequency or severity of poliomyelitic paralysis. In the small number of persons with localization of paralysis in the inoculated limb, the injections, for the most part, were given about 7 to 21 days prior to onset, which corresponds to the usual incubation period of poliomyelitis. This has raised the question as to whether or not inoculated persons have a greater chance of contracting poliomyelitis during an epidemic.

"There is as yet no final answer to this question, but it is a fact that, even if there should be an increased chance, it is extremely small. Many thousands of poliomyelitis cases occur every year among children who have not had any injections during the preceding few months, and thousands of children have received injections for whooping cough, diphtheria and tetanus during poliomyelitis epidemics and have not developed the disease.

"Diphtheria, tetanus and whooping cough are serious diseases which can be prevented by immunization. Unchecked, these diseases present a far greater hazard than poliomyelitis. The benefits derived from immunization against these diseases far outweigh the questionably small increased chance of contracting poliomyelitis. However, even this questionable risk can be avoided by carrying out these immunizations when poliomyelitis is not epidemic in the community. There appears to be no good reason for withholding these immunizations during the summer months in communities that are not having an epidemic of poliomyelitis.

"Furthermore, poliomyelitis is at all times so rare in infants under 6 months of age, and the danger from other infectious diseases, particularly whooping cough, is so great, that it is advisable to continue the immunization procedures for this age group even during a poliomyelitis epidemic. In adults also, poliomyelitis is relatively so infrequent, that when there is a need for immunizing or therapeutic injections, such injections should not be withheld.

"Certainly no parent should object and no physician should hesitate to administer a needed antibiotic, drug or other injection for treatment of disease at any time. When there is immediate danger from diphtheria, whooping cough or tetanus, the preventive inoculations should be given to all threatened age groups even during a poliomyelitis epidemic. In the final analysis the decision as to when an immunizing or therapeutic injection shall be given to an individual patient must rest with the physician."

INDIGENT MEDICAL CARE STUDY

The House of Delegates authorized in December, 1948, the creation of seven committees within the framework of the Council on Medical Service. Each committee has been concerned with a specific part of the general medical service field. The combined efforts of these committees will provide information on medical care activities and programs now being carried on that will assist the Council in developing plans for improving medical care throughout the nation.

One of these committees, the Committee on Indigent Care, has completed a general survey of plans throughout the United States showing the variations in approach to this problem and the extent to which medical societies officially participate in indigent programs. From the data collected it is evident that medical societies, both state and county, need to become more interested in medical care for the indigent in order that adequate programs may be developed.

To assist medical societies in meeting this problem, the committee has undertaken a series of studies of 12 community and four state indigent medical care programs, each of a different type. Since the primary interest of the committee is in physician participation, the study has been directed toward obtaining data that will enable the committee to evaluate the programs and make recommendations as to medical society participation.

Elsewhere in this issue of THE JOURNAL, the first article in a series to be published considers Erie County (Buffalo) New York as the study unit. In that county, a well-coordinated complete service program for the indigent has been developed. According to the committee, "the Erie County Indigent Medical Care Plan accomplishes the primary objective of any such plan. It makes available to the indigent sick all of the medical, hospital, and related services available to other citizens of the community and does this with a minimum of disturbance in the normal physician-patient relationship. Further, it has succeeded in partially compensating private physicians on a fee basis and in utilizing all available facilities, private and public, at a minimum of cost to the taxpayer."

ORGANIZATION SECTION

MEDICAL AID IN THE MISSOURI FLOOD AREAS

Stories of heroism and sacrifice are emerging from the muddy floodwaters of the mighty Missouri River, which surged through the Dakotas, Iowa, and Nebraska, leaving 2 million acres of farmland inundated, 130,000 persons homeless, and damage in excess of 2 million dollars. The little-told story of the part that physicians and nurses played all along the 1,000-mile front during the past few weeks is one of the bright chapters in American medicine.

James F. Mulqueen, mayor of Council Bluffs, Iowa, where almost the entire population of 45,000 joined with thousands of Army troops and National Guardsmen in a feverish, successful fight against the flood waters, expressed "grateful thanks to the doctors and nurses who gave aid to the sick and injured." Dr. Raymond F. Barnes, medical director for the midwestern area of the American Red Cross, said "the glorious job done by doctors and nurses did more to make me proud of my profession than anything I've seen in a long time."

In the populous Omaha-Council Bluffs area more than 25,000 persons were evacuated from their homes; the water supply was threatened; and about 1,400 persons were housed in Red Cross shelters. Despite such emergencies, there were no serious accidents or illnesses. Existing contagion did not spread, and not a single serious case of gastrointestinal illness was reported.

The Pottawattamie County Medical Society at Council Bluffs suddenly found itself faced with a gigantic task as the raging Missouri poured its mud and debris at the city's doorstep. As the frightening days wore on, the job became bigger.

Dr. Barnes related in a letter to his friend Dr. Frank E. Wilson of the American Medical Association's Washington office that "the disaster job, medically speaking, was a bare-knuckle fight—all out—no holds barred. Almost four million sand bags filled and used; 23 miles of dykes raised six feet; 6,000 soldiers on police duty; big earth-moving equipment on the job everywhere; 25,000 men working around the clock under floodlights and through rain, snow and wind; all businesses closed except restaurants, hotels, groceries and prescription drug stores; 26 shelters set up, three of them isolation shelters; 96 nurses on duty in Council Bluffs alone; a physician on duty in each shelter."

James Cumiskey, Alexandria, Va., who headed the Red Cross disaster operations in Council Bluffs, said the cooperation among the doctors during the emergency was "excellent—in fact, the very best."

The medical profession set up its operation to aid the stricken area in the following manner. The American Red Cross, under the local leadership of Dr. Isaac Sternhill, handled medical aid for evacuees, staffed the shelter areas, and supervised the first-aid stations. The city health officer, Dr. George J. Klok, was in charge of the control and prevention of communicable disease, sanitation, immunization, and isolation.

When Council Bluffs was faced with real danger, the medical society met and laid plans for the dark days ahead. The physicians cancelled all but emergency operations in all hospitals—neglected their own interests and waded in mud during the harrowing nights to do all they could for the community.

At one time three typhoid vaccination centers were in operation. Dr. Klok estimated that 10,000 "shots" were given at the centers, physicians' offices, and at the shelters during a nine day period. School nurses, the Visiting Nurses' Association, and the city's dental profession all cooperated in what was called "Operation Inoculation." Physicians were alerted when the city's water intake plant near the river was flooded, and an auxiliary supply had to be put into operation. The Army brought in a 180,000-gallon water purification unit, but it was never used. The Iowa State Department of Health sent a public health officer and several engineers who, Dr. Klok said, "offered valuable counsel on public health measures." Much of their time was spent in inspecting shelters for both civilians and army personnel.

Physicians were on duty almost continuously at the shelters. Measles, mumps, and chickenpox cases were handled in the isolation centers. A total of 75 infants who required bottle feedings were housed in the shelters. Physicians arranged for the city's hospitals to prepare the formulas and deliver them regularly to the shelters, where they were kept under refrigeration.

A serious accident threat loomed along the levees as thousands of men set to work building a "flashboard" to hold back the rising water. Four first-aid stations were set up, with the supplies being furnished by the American Red Cross. Most of the first-aid personnel was recruited from Creighton University medical school. Students also served wherever needed at the city's hospitals.

FEDERAL MEDICAL LEGISLATION

Federal Hospitalization for the Aged

Senators Murray of Montana and Humphrey of Minnesota introduced S. 3001 proposing to amend the Federal Old Age and Survivors Insurance System (Social Security) to provide insured aged persons (over 65) and their dependents, and survivors of deceased insured persons, with insurance against the cost of hospitalization. The number of persons eligible according to a Federal Security Agency estimate is 7,100,000. This program has been publicly advocated by the Social Security Administration and Oscar Ewing, Administrator of the Federal Security Agency for the past year. The chief features of the bill follow.

Benefits.—Bed, board, nursing, laboratory, ambulance, operating room, and usual drugs and appliances when the patient is hospitalized. Surgery, domiciliary care, and hospitalization for tuberculosis and mental conditions are not included. The maximum hospitalization annually would be 60 days. The certification for benefits would be made by the individual's attending physician.

Control of program.—The Administrator of the Federal Security Agency would prescribe and promulgate rules and regulations for the conduct of the program. A state would merely act as the agent of the Administrator in carrying out details, functioning through its designated health agency. In the event a state refuses to accept the agency agreement, the FSA Administrator would operate the program within such state. The Federal Hospital Council, presently functioning under the Hill-Burton Act, would act as an advisory committee.

Role of private insurance plans.—States or the Federal Security Administrator may utilize "the services of private nonprofit organizations" in dealing with hospitals.

Cost of program.—The program would cost between 191 and 235 million dollars annually at the outset, according to FSA estimates. The basis is $15 per day hospital cost multiplied by approximately two days hospitalization annually per person, multiplied by 7,100,000 eligible persons. The program would be financed entirely by the federal government from the Social Security Trust Fund. No financial contribution would be required from states.

Representatives Dingell of Michigan, and Celler of New York, introduced H. R. 7484 and H. R. 7485 respectively. Both bills are identical with S. 3001 above.

Disability Insurance Benefits

Representative Bailey of West Virginia introduced H. R. 7460, which would amend title 2 of the Social Security Act to provide benefits for permanently and totally disabled workers

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The summary of federal legislation was prepared by the Washington Office of the American Medical Association and the summary of state legislation by the Bureau of Legal Medicine and Legislation.

who are covered by Social Security. This amendment is similar to one of the Social Security Amendments of 1950 (H. R. 6000 of the 81st Congress) opposed by the A. M. A. and which was dropped from the final version of the bill as enacted.

STATE MEDICAL LEGISLATION

Massachusetts

Bills Introduced.—H. 2328, proposes that the committee on Public Welfare make an investigation and study relative to **hospital expenses** in connection with the support of poor persons. S. 587, proposes the creation of an unpaid special commission to make an investigation and study of care and treatment of **tuberculosis.**

Michigan

Bills Enacted.—H. 172, has become Public Act No. 170 of the Acts of 1952. It authorizes cities, villages and townships and combinations thereof to form **hospital authorities** for the purpose of planning, promoting, acquiring, constructing, improving, enlarging, extending, owning, maintaining, and operating community hospitals within the area. S. 240, has become Public Act No. 137 of the Acts of 1951. It provides regulations for the licensing of trained, certified, **graduate professional nurses, practical nurses, and trained attendants.** S. 301, has become Public Act No. 172 of the Acts of 1952. It amends the medical practice act by, among other things, permitting the board to grant **temporary, annual licenses to practice to doctors of medicine** who are pursuing postgraduate study and who meet all qualifications and conditions for the practice of medicine except the making of the application and the taking of the examination required for a permanent license.

Mississippi

Bills Enacted.—H. 347, was approved April 12, 1952. It amends the law prohibiting the sale of **barbituric acid** without a doctor's prescription by providing that when a violation of the act is committed against a minor the person so convicted shall be sentenced to the penitentiary for a term of not less than one nor more than five years. H. 385, was approved April 9, 1952. It authorizes the necessary examinations of applicants for assistance to the blind to be made by either an **ophthalmologist or an optometrist.** H. 631, was approved April 12, 1952. It provides an appropriation for the purpose of defraying the expenses of a special program of eradication and control of **syphilis and other venereal diseases** by the state board of health. H. 744, was approved April 9, 1952. It provides an appropriation to the Mississippi Commission on Hospital Care for the purpose of building, erecting, and equipping **hospitals and other health facilities** within the state, including nursing homes, schools of nursing, health centers, health departments, clinics, and related facilities. H. 955, was approved April 11, 1952. It provides an appropriation for defraying the expenses of treating children afficted with **cerebral palsy.** H. 972, was approved April 11, 1952. It provides an appropriation to the Board of Trustees of state institutions of higher learning for the purpose of providing necessary equipment, teaching staff, and personnel for general expenses of a **school of nursing** of the University of Mississippi. H. 981, was approved April 12, 1952. It provides an appropriation to the Board of Trustees of state institutions of higher learning for the purpose of paying for **scholarships for advanced studies in nursing.** S. 268, was approved April 11, 1952. It authorizes the trustees of higher institutions to provide **scholarships** in an amount not to exceed $100 annually **for student nurses** who will enter training in nursing in the state. S. 330, was approved April 15, 1952. It amends the law relating to medical scholarships by providing that the state medical education board shall have the power and authority to allow and permit a reasonable number of persons granted **scholarships** to practice in any of **the state's mental institutions** under the management of the Board of Trustees of such institutions and that such practice shall constitute practice in Mississippi for the purpose of the act. S. 642, was approved April 14, 1952. It provides an appropriation to the Board of Trustees of state institutions of higher learning for the purpose of paying for **scholarships for advanced studies** in nursing as provided by the act establishing the nursing scholarship program.

New Jersey

Bills Enacted.—A. 13, has become Ch. 102 of the Laws of 1952. It provides for the enactment of a prevention of chronic illness act which will establish a division of chronic illness control in the department of health for the prevention, early detection and control of **chronic illness and rehabilitation of the chronic sick.** A. 179, has become Ch. 78 of the Laws of 1952. It provides among other things, that no person shall disclose the name or address or identity of any person known or suspected of having a **venereal disease** except to the person's physician or to a health authority or, in the event of a constitution under the state's criminal law, to a prosecuting law officer or the court, provided that the person's physician or a health authority may disclose the name and address or identity of such person when and only when the physician or health authority shall deem such exclosure necessary to protect the health or welfare of the person or of his family or of the public. A. 540, has become Ch. 90 of the Laws of 1952. It amends the law relating to **narcotic drugs** by making it a high misdemeanor for any person to sell, give, or administer or dispense narcotic drugs to persons under the age of 18 years. A. 561, has become Ch. 95 of the Laws of 1952. It amends the law relating to **narcotic drugs** by providing that any person who induces or persuades any other person to use any narcotic drug unlawfully or aids or contributes to the addiction of any other person shall be guilty of a high misdemeanor. S. 61, has become Ch. 12 of the Laws of 1952. It provides a method for granting disability, death and medical and **hospital benefits** for civil defense volunteers who suffer injury as a result of participation in civil defense activities.

Rhode Island

Bill Introduced.—H. 1005, proposes a resolution that the Senators and Representatives from Rhode Island in the Congress of the United States be earnestly requested to use every effort to have passd the proposd **Murray-Dingell Bill.**

Bills Enacted.—H. 797, was approved Aprid 23, 1952. It directs the Rhode Island Development Council to conduct a survey of the functions and needs of the **state mental health program** to determine the physical facilities needed in the future to carry on such a program and to prepare a general guide plan for development and improvement of the physical facilities of the state welfare institutions. S. 132, was approved April 24, 1952. It provides regulations for the **licensing of professional and practical nursing.**

PHYSICIANS AND SCHOOLS REPORT PRINTED

The Bureau of Health Education announces the publication of the Report of the Third National Conference on Physicians and Schools. This conference was held at Highland Park, Ill., in November, 1951, and was attended by physicians, educators, and public health personnel, particularly the official representatives of state and territorial medical associations, health departments, and education departments. Complimentary copies have been sent to the presidents and secretaries of all state medical associations, the executive officers of all state health and education departments, and those who attended the conference.

It is suggested that medical societies, both state and local, purchase copies of this report for their officers and the committee concerned with the school health program. Quantity prices will be submitted on request by the Order Department of the American Medical Association.

This 72-page pamphlet reports the deliberations of the five discussion groups that considered health appraisal of school children, emergency services for accidents and sudden illness, health services in physical education, including athletics, follow-up to meet child health needs, and new concepts in control of communicable diseases.

SECRETARIES NAMED FOR MEDICAL EDUCATION AND STUDENT GROUPS

Division of executive secretarial duties of two groups of the American Medical Association—the American Medical Education Foundation and the Student A. M. A.—has been announced by the executive committee of the Association's Board of Trustees. Activities of both groups have expanded to such an extent that one secretary no longer can serve both groups, it was stated.

Russell F. Staudacher, Park Forest, Ill., who has been serving as secretary for both groups during the past year, will devote full time as executive secretary of the Student A. M. A. and as executive editor of its publication, the *Journal of the Student American Medical Association.*

Hiram W. Jones, Elmhurst, Ill., has been appointed executive secretary of the American Medical Education Foundation. He formerly was associated with the Research Council for Economic Security, Chicago, was director of finance for the Chicago region of the National Conference of Christians and Jews, and was director of fund raising for Community Relations Consultants, Inc., specializing in hospital fund raising.

QUARTERLY CUMULATIVE INDEX MEDICUS

Volume 48 of the Quarterly Cumulative Index Medicus, covering the literature for the last half of 1950, was mailed to subscribers in March and is now available for purchase from the Order Department of the American Medical Association. Volume 49 (January-June, 1951) is in press, but it will not be ready for distribution for several months.

MEDICAL NEWS

CALIFORNIA

Dr. Lisser Honored.—A dinner honoring Dr. Hans Lisser was given on April 12 at the Bohemian Club in San Francisco. The occasion was his 64th birthday and also the publication of the April, 1952, edition of *Postgraduate Medicine*, which was dedicated to the endocrine clinic of the University of California Medical School, of which he is the chief. The issue contains a collection of papers on adrenal tumors by various authors from the university.

Symposium on Hypnosis.—The University of California Extension, Los Angeles, will conduct a symposium on hypnosis for graduates of approved medical and dental schools, for psychologists, psychiatrists, and sociologists, and for graduate students in psychology, psychiatry, and social welfare, June 25-27. Sessions will be held in the chemistry building on the Los Angeles campus of the university from 9 a. m. to 5 p. m. The present status of hypnosis will be evaluated. Applications should be sent to Dr. Thomas H. Sternberg, Medical Extension, University of California, Los Angeles 24. The fee for the course is $50, with a reduced fee of $25 for students now working toward graduate degrees in psychology or psychiatry.

Quarantine on Mussels.—California's yearly quarantine on mussels, which went into effect May 1, prohibits gathering of the shellfish for any use but fish bait until next Oct. 31. Dr. Wilton L. Halverson, state director of public health, warned that "one bite of a mussel can be fatal during the summer, due to the deadly poison produced in these edible shellfish by certain foods they eat at this time of year." Clams are subject to summer poisoning to a lesser degree. White meat of clams is safe if it is thoroughly cleaned and washed, but all dark parts should be discarded. When sold for fish bait during the quarantine period, mussels must be broken open, and any container from which they are sold must be prominently labeled: "For Fish Bait Only—Unfit for Human Consumption."

FLORIDA

Society News.—At the recent annual meeting of the Gulf Coast Clinical Society in Pensacola, Dr. Alvin L. Stebbins of Pensacola was elected president, and Dr. Dale E. York of Pensacola, secretary-treasurer.

Meeting of Naval Officers and County Society.—The Monroe County Medical Society and the Naval Medical Officers, Key West Area, held a joint meeting of the U. S. Naval Hospital, Key West, on March 20. Dr. Joseph L. Fetterman, former assistant clinical professor for mental diseases, Western Reserve University School of Medicine, Cleveland, spoke on "How to Deal with Depressions."

GEORGIA

Laboratory Diagnosis of Tuberculosis.—In cooperation with the Division of Chronic Disease and Tuberculosis, U. S. Public Health Service, the bacteriology laboratories of the Communicable Disease Center, Chamblee, will offer two courses in the laboratory diagnosis of tuberculosis on the following dates: May 19-23 and Nov. 3-7. Practical laboratory training in preparation of culture mediums, microscopy, cultural procedures, diagnostic use of animals, and testing of drug sensitivity will be included. No tuition or laboratory fees will be charged. Information may be obtained from the Officer in Charge, Laboratory Training Services, Communicable Disease Center, U. S. Public Health Service, P. O. Box 185, Chamblee.

ILLINOIS

Personal.—Dr. Louis B. Newman, chief, physical medicine and rehabilitation service at Veterans Administration Hospital, Hines, held clinics and addressed the staff of the Veterans Administration Hospital and the faculty of the University of Arkansas School of Medicine at Little Rock, Ark., on April 28. His lecture-demonstration was on "Physical Medicine and Rehabilitation of Patients with Spinal Cord Injuries."

Secretaries' Conference.—A dinner meeting, open to all members of the Illinois State Medical Society, will be held Tuesday evening, May 13, at 6 p. m. in the Crystal Room of the Hotel Sherman, Chicago. Participating in a panel on public relations will be Mr. Leo Brown, director of public relations, American Medical Association; Dr. Warren W. Furey, past president of the Chicago Medical Society; and Dr. Robert E. Heerens of Rockford, chairman of the public relations committee of Winnebago County Medical Society. Dr. Percy E. Hopkins of Chicago will serve as moderator.

Chicago

Film Award.—A motion picture film by Drs. Paul C. Holinger and Kenneth C. Johnston, Chicago, entitled "The Endoscopic Appearance of Diseases of the Trachea," has been awarded the American College of Surgeons' Certificate of Merit as the best teaching film reviewed by its committee in 1951.

Grants for Research.—Three Chicago area firms have awarded grants to the University of Illinois College of Medicine to support research. The Wander Company has renewed a grant in the amount of $2,000 for research on nutrition that is being conducted by Dr. Kwang S. Kim. Abbott Laboratories has made a $1,600 grant in partial support of a study of connective tissue in allergy that is being directed by Dr. Max Samter. Armour and Company has added $900 to a previous grant to Dr. Louis R. Limarzi for an investigation of blood diseases.

Personals.—Dr. Derrick T. Vail left at the end of March for Dublin, Ireland, where he presented the annual Montgomery Lecture of the Royal College of Surgeons of Ireland on April 17. The Ophthalmological Society of the United Kingdom held its annual meeting at the same time and place.——Dr. Clark W. Finnerud was made an honorary member of the Minnesota Dermatological Society on Feb. 15. Recently he was elected a corresponding member of the Societas Dermatologica Svecica (Sweden) and the Societas Dermatologica Austriaca (Austria).——Dr. Hiram T. Langston, who will head the department of surgery at the new Chicago State Tuberculosis Sanitarium, presently under construction, has joined the staff of the University of Illinois College of Medicine as clinical associate professor of surgery. He will also serve as a consultant in thoracic surgery at Veterans Administration Hospital, Hines, Ill.——Dr. Harry R. Hoffman, director of the mental hygiene section of the city health department, has resigned to return to private practice as a neuropsychiatrist. He has been succeeded by Dr. Irene C. Sherman, who was his assistant.——Dr. Maurice H. Cottle recently gave a course on "Reconstructive Surgery of the Nasal Septum" at the Hartford (Conn.) Hospital.——Dr. Abraham Levinson addressed the College of Physicians of Philadelphia March 27 on "The History of Pediatric Neurology and Psychiatry."——Dr. Samuel J. Taub, chairman, department of allergic diseases, Chicago Medical School, lectured recently on "The Role of Allergy in General Practice and Surgery" at the annual meeting of the Lackawanna County Medical Society in Carbondale, Pa.

IOWA

Narcotic Violation.—Drs. Bernice E. Brown and Gerald Franklin Brown, Iowa City, pleaded [illegible] to a violation of the Iowa uniform narcotic drug law [illegible] Jan. [illegible] were fined $1,000 each.

Physicians are invited to send to this department items of news of general interest, for example, those relating to society activities, new hospitals, education and public health. Programs should be received at least three weeks before the date of meeting.

Speech Clinic.—The University of Iowa will give a six week speech clinic for about 50 to 60 children as part of its summer training and research program. The clinic operates as a residential program from June 23 to Aug. 1, serving boys and girls from 7 to 16 in housing units operated by the clinic. Those interested in positions on the clinic or dormitory staff should write to Frederic L. Darley, Ph.D., Speech Clinic, University of Iowa, Iowa City.

MARYLAND

New Film Available.—"Frontiers in Medical Research," a new film in sound and color, prepared by the Maryland Society for Medical Research, is available for exhibition purposes. The film shows activities in the various research laboratories throughout Baltimore, with special emphasis on the types of animals used and the procedures employed. Loan of the film may be arranged by writing to the society, 522 W. Lombard St., Baltimore 1.

MASSACHUSETTS

Personals.—Dr. Henry K. Beecher, Boston, was recently made an honorary member of the Royal Society of Medicine, London. ——Dr. Chester North Frazier, professor of dermatology at Harvard University, has succeeded Dr. William LeRoy Fleming as president of the Massachusetts Society for Social Hygiene. Dr. Fleming recently resigned as chief of the genitoinfectious disease clinic at the Massachusetts Memorial Hospitals to become professor of preventive medicine at the University of North Carolina Medical School.——Dr. Roy F. Feemster, Boston, director, division of communicable diseases, Massachusetts Department of Public Health, has departed for Pakistan as one of a team of experts loaned to Pakistan under the Point Four program of the Department of State. Other members of the party include experts in industry, agriculture, and education.

Harvard Alumni Day.—Dr. John W. Cline, Harvard '25, President of the American Medical Association, will speak in amphitheatre E, Harvard Medical School at noon, May 28. After luncheon the Alumni Day Symposium will be presented by the following collaborators:

Mark D. Altschule, Belmont, Relations Between Endocrinology and Psychiatry from 1682 A. D. to the Present Day.
Walter Bauer, Boston, Modern Medical Triology.
Reginald Fitz, Boston, How to Get Your Sons into Harvard Medical School.
Dwight E. Harken, Boston, Abuse of the Surgeon by Physicians Whose Patients Have Mitral Stenosis.
A. Baird Hastings, Ph.D., Boston, Biological Adventures with Isotopes.
Arthur T. Hertig, Boston, Pathologist's Retreat into Embryonic State.
Eugene M. Landis, Boston, Human Element in First Year Physiology.
S. Burt Wolbach, Boston, Glorious Past and Uncertain Future of Pathology.

MICHIGAN

Personal.—Dr. Carl C. Coolbaugh, instructor of anatomy at Wayne University College of Medicine, Detroit, has been awarded a national research fellowship by the Arthritis and Rheumatism Foundation for a year's investigation into the causes of arthritis.

Alumni Reunion.—The Children's Hospital of Michigan in Detroit will hold its annual clinic day and alumni reunion on May 14. Out-of-state speakers will include:

Charles N. Pease, Chicago, Avascular Necrosis of Bone in Children.
S. Alexander Nadas, Boston, Primary Myocardial Disease in Infants and Children.
Martin H. Wittenborg, Boston, Congenital Heart Disease and the Radiologist.
Luther A. Longino, Boston, Congenital Heart Disease and the Surgeon.

MISSISSIPPI

Mississippi Honors Its Physicians.—Mississippi's 1,500 physicians were honored on March 30 when the state observed "Doctor's Appreciation Day." The occasion was set aside in a gubernatorial proclamation by Gov. Hugh L. White, who enjoined statewide observance in appreciation of the physicians' personal dedication to service.

State Medical Meeting in Jackson.—The annual meeting of the Mississippi State Medical Association will be held at the Hotel Robert E. Lee in Jackson May 13-15, under the presidency of Dr. James G. Thompson of Jackson. Out-of-state speakers include:

Charles A. Jones, New Orleans, Use of ACTH and Cortisone.
A. Neal Owens, New Orleans, Rehabilitation of Crippled Children.
Clifford G. Grulee Jr., New Orleans, Colic in Infancy.
Alvyn W. White, Pensacola, Fla., Bleeding from the Gastrointestinal Tract in Pediatrics.
Paul S. Williamson, Memphis, Training for General Practice.
Hugh R. Williams, Atlanta, Epidemiology and Control of Infectious Hepatitis.
Philip M. Lewis, Memphis, External Diseases of the Eye.
Mercer G. Lynch, New Orleans, Laryngofissure.

The Woman's Auxiliary will meet May 13-14 at the Hotel Heidelberg in Jackson.

MISSOURI

Personal.—The American Speech and Hearing Association has awarded the honors of the association for distinguished contribution to the field of speech and hearing to Dr. Hallowell Davis of St. Louis.

Medical Alumni Meeting.—The annual reunion of the medical alumni of St. Mary's Group of Hospitals (St. Louis University) will be held at St. Mary's Hospital, 6420 Clayton Road, St. Louis, May 15, under the presidency of Dr. Harry K. Purcell of St. Louis. The morning sessions will begin at 8:30 with a medical surgical conference, followed by case presentations and a genitourinary conference. The afternoon program by staff members of the St. Louis University School of Medicine will include:

Problems of Behavior in Children, Dr. Peter G. Danis, professor of pediatrics and chairman of the department.
Rehabilitation in the Home, Dr. D. Elliott O'Reilly, instructor in orthopedic surgery.
Uses and Misuses of Intravenous Pyelography, Dr. James M. Macnish, assistant professor of clinical urology.
St. Louis Maternal Mortality Survey—1951, Dr. Roy V. Boedeker, senior instructor in gynecology and obstetrics.
Common Rectal Lesions, Dr. Francis J. Burns, instructor in surgery and assistant director of resident staff in surgery.

NEW YORK

Society News.—The Nassau Radiological Society, Baldwin, was organized Jan. 29. Dr. Percival A. Robin, Hempstead, was elected president; Dr. Joseph J. La Vine, Baldwin, secretary, and Dr. David L. Jellinger, Patchogue, treasurer.

Living in Cellars Is Illegal.—Because the illegal use of cellars as living quarters is increasing steadily in Manhattan and some sections of Brooklyn and the Bronx, Dr. John F. Mahoney, commissioner of the City of New York Department of Health, announces that the department will join with other city agencies to halt the growth of the practice and to help families now living in cellars to get other quarters. Letters are being sent to 40,000 property owners and landlords of 60,000 buildings in Manhattan warning them that the use of cellars for sleeping or residence purposes is a violation of the Sanitary Code, punishable, on conviction, by a fine not exceeding $500, or imprisonment up to one year, or both.

New York City

Tumor Conference.—The Harlem Hospital Tumor Conference will be held May 21 at 10:45 a. m. in the main floor conference room of the women's pavilion. Dr. Isidore Snapper, director of medical education, Mount Sinai Hospital, will speak on "Multiple Myeloma."

Harvey Lecture.—Laszlo Zechmeister, professor of organic chemistry, California Institute of Technology, Pasadena, will deliver the ninth Harvey Lecture of the current series at the New York Academy of Medicine on May 15 on "Biochemical Studies Based on Chromatographic Methods."

Dr. Gellhorn to Head Cancer Research Institute.—Dr. Alfred Gellhorn, associate professor of clinical cancer research at the College of Physicians and Surgeons, Columbia University, has been appointed director of the university's Institute of Cancer Research, succeeding Dr. Cushman D. Haagensen.

OHIO

Personal.—Members of the local section of the American Chemical Society honored Dr. Martin H. Fischer, University of Cincinnati physiologist, at their annual Eminent Chemist Night April 9, awarding him an inscribed scroll. Dr. Fischer discussed "Colloids in Industry and Medicine."

Courses in Speech and Hearing.—Western Reserve University offers a summer session in speech and hearing at the Cleveland Hearing and Speech Center. Professor Albert Douglas of the University of Texas and Texas State School for the Deaf will be among the guest lecturers. An institute on voice pathology will be featured during the second session. The first six week session begins June 16 and the second July 28. For information write Director of Admissions, Western Reserve University, Cleveland 6.

State Medical Meeting in Cleveland.—The Ohio State Medical Association will hold its annual meeting at the Cleveland Public Auditorium May 20-22, under the presidency of Dr. Fred W. Dixon of Cleveland. Dr. John W. Cline of San Francisco, President of the American Medical Association, and Mr. Leo Brown of Chicago, director of the Association's department of public relations, will discuss "You and Your AMA." Other guest speakers will include:

Robert L. Flett, Derby, England, Success and Failure of the Portmann Operation.
Albert D. Ruedemann, Detroit, End Results of Muscle Surgery.
Joseph H. Kiefer, Chicago, Undescended Testis: Types and Management.
William M. Wallace, Boston, Management of Childhood Diabetes.

PENNSYLVANIA

Dr. Weidman Honored.—The *Journal of Investigative Dermatology* dedicates a "festschrift" number, the March issue, to Dr. Frederick D. Weidman, emeritus professor of research in dermatology and mycology, University of Pennsylvania School of Medicine, Philadelphia. The editors describe Dr. Weidman as "the first American scientist to have devoted himself solely to basic laboratory research and teaching oriented toward the problems of disease of the skin."

Philadelphia

Personal.—Dr. Truman G. Schnabel Jr. has been appointed a scholar in medical science by the John and Mary R. Markle Foundation of New York. The appointment is accompanied by a grant of $30,000 to the Medical School of the University of Pennsylvania toward the support of Dr. Schnabel as a teacher and research worker during the next five years.

Exhibit of Medical Prints.—A new collection of medical art by the masters, from Rembrandt and Goya to Daumier and Toulouse-Lautrec, has been assembled by the Philadelphia Museum of Art through the support of Smith, Kline & French Laboratories. The 85 prints, titled "Ars Medica," will remain on exhibition at the museum through May 25. The exhibit includes famous and rare pieces of graphic art on medical subjects from sources in this country and abroad. The earliest piece of art in the collection is a silver drachma from the island of Cos, of about 150 B. C., portraying a head of Asklepios, the Greek god of medicine. The exhibit is divided into 15 sections, whose titles reveal the broad panorama of medicine covered.

SOUTH CAROLINA

Annual State Medical Meeting.—The annual meeting of the South Carolina Medical Association will be held at the Ocean Forest Hotel, Myrtle Beach, May 13-15, under the presidency of Dr. Joseph D. Guess of Greenville. Dr. Loudon C. Reid, associate professor of physiology, New York University School of Medicine, and professor of experimental surgery in the Post-graduate Medical School of New York University, will be the guest speaker. On Wednesday afternoon he will present a paper on "Mechanisms of Acid Base Balance of Clinical Significance," and at the Thursday afternoon session his topic will be "The Role of the Kidney in Sodium and Potassium Excretion and Water Balance."

WISCONSIN

Clinics at Appleton and Janesville.—The Council on Scientific Work of the State Medical Society of Wisconsin in cooperation with the State Board of Health, the Wisconsin Division of the American Cancer Society, Wisconsin Anti-Tuberculosis Association, the Wisconsin Heart Association, the Wisconsin chapters of the National Foundation for Infantile Paralysis, the Wisconsin Academy of General Practice, and the University of Wisconsin Medical School and Marquette University School of Medicine will hold clinics May 13 at the Monterey Hotel, Janesville, May 14 in Stevens Point, and May 15 at the Elks Club, Appleton. The speakers are as follows:

M. Edward Davis, Chicago, Responsibilities of the Obstetrician in the Problem of Prematurity.
Walter Zeit, Ph.D., Milwaukee, Fractures of Upper and Lower Extremities.
Bruce J. Brewer, Milwaukee, Trends in Therapy of Extremity Fractures.
John W. Towey, Powers, Mich., Advances in Treatment of Tuberculosis.

Clinics will be held on May 20 at the Racine Country Club, Racine, May 21 at the Riverview Country Club, Menominee, Mich., and on May 22 at the Foeste Hotel, Sheboygan. Speakers at these clinics and their first presentations include:

O. Sidney Orth, Madison, Pharmacologic Action of Cardiac Drugs.
Ovid O. Meyer, Madison, Therapeutic Use of Cardiac Drugs.
Edmund B. Flink, Minneapolis, Diagnosis and Treatment of Hyperthyroidism.
Walter J. Reich, Chicago, Common Gynecologic Surgical Procedures.

The fee for the spring clinic only is $6; for spring clinic and two hospital conferences, $10.

GENERAL

Allergists' Election.—At the annual Congress of the American College of Allergists in Pittsburgh, April 7-9, Dr. J. Warrick Thomas of Richmond, Va., was named president; Dr. M. Murray Peshkin, New York, president-elect; and Dr. Frederick W. Wittich, Minneapolis, secretary-treasurer.

Joint Neurological Meeting.—The annual meeting of the American Neurological Association was held as a joint meeting with neurologists from South America on May 8-10 in Atlantic City, N. J., under the presidency of Dr. S. Bernard Wortis of New York. There were 64 presentations (9 with motion pictures), 9 papers were read by title, and 2 demonstrations were given.

Meeting on Medical History.—The American Association of the History of Medicine held its annual meeting at the University of Kansas School of Medicine in Kansas City and Lawrence, Kan., May 1-3, under the presidency of Dr. Ralph H. Major. The Fielding H. Garrison Lecture, "Growth of Medicine and the Letter of the Law," was delivered by Dr. Benjamin Spector of Boston.

Name Medical Director of American Heart Association.—Dr. Charles D. Marple, assistant clinical professor of medicine, University of California School of Medicine, San Francisco, has been appointed medical director of the American Heart Association. Dr. Marple will administer the research policies and scientific program of the association as developed by its scientific council and will direct the program of physician education.

Biological Psychiatry Meeting.—The Society of Biological Psychiatry will hold its annual convention at the Hotel Claridge, Atlantic City, N. J., May 11. Presentations by individual authors will include:

James W. Papez, Columbus, Ohio, Forms of Living Organisms in Nerve Cells in Psychotic Patients.
John D. Campbell, Atlanta, Manic-Depressive Psychosis in Children.
Roland P. Mackay, Chicago, Reflections on Memory.
Nick D. Ischlondsky, New York, Role of Cortex in Consciousness as Learned from Conditioned-Reflex Studies.
Ladislas J. Meduna, Chicago, Mode of Action of CO_2 Treatment in Human Neuroses.
Charles M. Pomerat, Ph.D., Galveston, Texas, Further Observations on Nerve Tissue in Vitro.

Tuberculosis Meetings.—The National Tuberculosis Association, American Trudeau Society, and the National Conference of Tuberculosis Workers will hold joint annual meetings in Boston at the Statler and Sheraton Plaza hotels May 26-29. The medical sessions will include panel discussions on "Bacteriology of Tuberculosis," "Relationship of ACTH and Cortisone to Pulmonary Disease," "Pulmonary Suppuration," "Chemotherapy in Tuberculosis," and "Excision Therapy in Tuberculosis." There will be seminars on "Mechanical Treatment of Acute and Chronic Underventilation of the Lungs," "Host Resistance in Tuberculosis," "Relapse in Pulmonary Tuberculosis as Related to Treatment," and "Sarcoidosis." A special evening session May 26 will be devoted to "Isonicotinic Acid Derivatives in Tuberculosis Treatment."

Otological Society Meeting.—The American Otological Society, Inc., will hold its annual meeting at the Royal York Hotel, Toronto, Canada, May 18-19, under the presidency of Dr. Gordon D. Hoople of Syracuse, N. Y. Single presentations will be made by the following:

Albert C. Furstenberg, Ann Arbor, Mich., Anatomical Considerations of Vertigo.
C. Stewart Nash, Rochester, N. Y., Noise in Industry—Medicolegal Implications.
D. E. Staunton Wishart, Toronto, Canada, Problem of Hearing Defects in Children.
Victor Goodhill, Los Angeles, Tinnitus Identification Test.
George E. Shambaugh Jr., Chicago, Developmental Anomalies of Sound Conducting Apparatus and Their Surgical Correction.

Meeting on Mental Deficiency.—The annual meeting of the American Association on Mental Deficiency will be held at the Hotel Bellevue-Stratford, Philadelphia, May 27-31 under the presidency of Dr. Edward J. Engberg of Faribault, Minn. Papers to be presented at the section meeting on medicine and psychiatry on Tuesday include:

Susan A. Slakis, Lincoln, Ill., Study of Digestive Process and Food Assimilation in Spastic Children with Malnutrition.
George Tarjan and Foley Benson, Pacific Colony, Spadra, Calif., Report on Pilot Study at Pacific Colony.
George Tarjan and Katherine Sharfman, Pacific Colony, Spadra, Calif., Two Years Experience with General Purpose Mental Hygiene Clinic in Hospital for Mental Defectives.
Philipp Schwartz, Wrentham, Mass., Pathogenesis of Status Marmoratus.
Catherine DeEtte Edgett, Laurelton, Pa., (Ethel N. Hartzler, Sunbury, Pa., author), Ten-Year Survey of Girls Discharged from Laurelton State Village.

On Thursday the meeting will be held in the Music Hall at the Elwyn (Pa.) Training School, where Dr. Elmer C. Jackson will discuss "Types of Mental Deficiency: Their Diagnosis and Treatment."

American Laryngological, Rhinological, and Otological Society.—This society will hold its annual meeting May 20-22 at the Royal York Hotel, Toronto, Canada, under the presidency of Dr. C. Stewart Nash of Rochester, N. Y. Dr. DeForest C. Jarvis of Barre, Vt., will be guest of honor. Dr. Scott Stevenson, London, England, will speak on "Socialized Medicine in England." There will be a symposium on "Relationship of Bronchoscopy to Chest Surgery," with Dr. Frederick G. Kergin of the University of Toronto and Drs. Chevalier L. Jackson of Philadelphia and Edwin N. Broyles of Baltimore as collaborators. Participating in a symposium on "Surgical Treatment of Hydrops of the Labyrinth" will be Drs. Kenneth M. Day of Pittsburgh, Robert L. Fleet of Derby, England, Kenneth G. McKenzie of the University of Toronto, and Percy E. Ireland and Hugh O. Barber of Toronto, Canada. Three motion pictures will be shown: "Pathology of the Nasopharynx" (Drs. Barney M. Kully and Henry J. Rubin, Los Angeles, by invitation); "Surgical Correction of Congenital Ear Canal Atresia with Restoration of Practical Hearing" (Dr. Howard P. House, Los Angeles), and "Adult Tonsillectomies Using Pentothal Sodium, Curare, Pontocaine, and Novocaine as the Anesthetic" (Dr. Fordyce Johnson, Pasadena, Calif.).

Estimated Annual Toll of Rabies.—In a recent address before the Minnesota Veterinary Society in Minneapolis, James H. Steele, M.P.H., of the U. S. Public Health Service said that conservative estimates of the annual rabies toll in the United States include 500,000 persons exposed to dog-bite, 40,000 of whom must take the Pasteur antirabies treatment; about 40 human deaths; 12,000 dog and 1,000 cattle fatalities; $1,000,000 loss in domestic animals; $5,000,000 medical and public health expense for such items as Pasteur treatments and laboratory services; immeasurable loss in wages, human suffering, and anxiety.

Dr. Steele pointed out that the control of rabies requires the cooperation of the general public as well as the efforts of official agencies and professional groups. Effective rabies control means more than establishment of vaccination clinics and stray dog control. It means, he said, that the lay public must be stimulated to do something about rabies. No rabies program can be successful, however, unless there is good dog control, the speaker said. That canine rabies can be controlled has been demonstrated in a number of cities and rural areas. One of the latest technical developments is the chick-embryo vaccine, which has been proved safe and effective in protecting dogs against rabies.

Community agencies and persons can get rabies pamphlets, posters, and other literature from the Communicable Disease Center, Atlanta, Ga.; Health Publications Institute, Raleigh, N. C.; Metropolitan Life Insurance Company, New York; and the American Veterinary Medical Association, Chicago.

CANADA

Summer School.—The Vancouver Medical Association will conduct a summer school May 26-30 at the Hotel Vancouver. Dr. MacDonald Critchley, dean of the Institute of Neurology, The National Hospital, London, will lecture on "The Body Image" and "Huntington's Chorea." Dr. Leland G. Hunnicutt of Pasadena, Calif., will speak on "The Chronically Congested Ear," "Control of Hemorrhage in Ear, Nose, and Throat," "When to Advise Ear, Nose, and Throat Operations," and "Improved Techniques in Tonsillectomy." Dr. R. Gordon Douglas, obstetrician and gynecologist-in-chief of the New York Hospital, will give five lectures, with titles to be announced. Dr. John F. McCreary, head of the department of pediatrics, University of British Columbia, will give four pediatric lectures, and Dr. William Boyd, professor of pathology, University of British Columbia, will discuss "Industrial Cancer." *Information may be obtained from Dr. John A. Irving, Secretary, Summer School* Committee, 1807 W. 10th Ave., Vancouver 9, B. C.

FOREIGN

WHO Consultants Arrive in Philippines.—Consultants of the World Health Organization have arrived in Manila to give advice in the yaws-control project and BCG antituberculosis vaccination campaign being conducted by the Philippine government with the assistance of WHO and the United Nations International Children's Emergency Fund. The consultant for the yaws program is Dr. C. M. Hasselman, director of the skin clinic at Erlangen University, Germany, formerly WHO's chief medical adviser in the Indonesian government's antiyaws campaign. The consultant for the antituberculosis program is Dr. Anton Geser of Denmark. He has served for nearly four years in similar BCG campaigns in Germany, Poland, Palestine, Syria, and Egypt and most recently was chief of a BCG mission in Ceylon.

Cerebrospinal Meningitis in Africa.—According to the World Health Organization's Regional Office for the Eastern Mediterranean, Alexandria, cerebrospinal meningitis is the most widespread epidemic disease in Africa, responsible in the past 10 years for perhaps 500,000 cases and thousands of deaths. In the Sudan the incidence increased from 6,000 cases in 1950 to 57,000 in 1951 and shows no signs of abating. This increase may be more apparent than real, according to Dr. Wasfy Omar, chief of the Regional Epidemiological Intelligence Service, since "knowledge of the miraculous cures that have been achieved with sulfa drugs has spread into every hella, or collection of mud huts, in the country, and cases that previously would never have been declared are now brought on improvised stretchers by forced marches to quarantine units for treatment."

The WHO office added that treatment however has not been sufficient to stop the great waves of the epidemic, which usually begin in October and continue as long as the hot, dry weather lasts, stopping abruptly at the onset of the rainy season in June. Egypt, the Sudan, Ethiopia, and West, East, and Central Africa have been affected. Native populations are particularly susceptible, since many do not wear clothes and whole families huddle together in their small huts to keep warm in winter. The almost universal existence of carriers gives an epidemic of cerebrospinal meningitis a special form. An epidemic may break out when the so-called "carrier rate" goes over 50%.

The WHO team proposed new control measures involving the control of a whole community where the disease has appeared and an attempt to reduce the carrier rate below the danger line by injecting the whole population with procaine penicillin in oil. This was done in two villages. Other villages were treated in a similar manner with sulfonamide drugs in various forms, and neighboring villages were used for control purposes. Results of these experiments are now awaited.

Dr. William E. Clark of the U. S. Public Health Service is on loan to the World Health Organization for a study of the epidemiology of the cerebrospinal meningitis epidemic in the Sudan.

CORRECTION

Employment of Bus Operators with Myocardial Damage.—The author of the letter by this title in The Journal, April 5, 1952, page 1243, Dr. O. P. J. Falk, requests publication of the following addendum:

I do not believe that this suggested policy of rehabilitation is applicable to drivers of long distance inter-city lines or to railroad engineers, either of which are responsible for maintaining a high rate of speed for relatively long distances.

EXAMINATIONS AND LICENSURE

BOARDS OF MEDICAL EXAMINERS

Alabama: *Examination.* Montgomery, June 24-26, 1952. Sec., Dr. D. G. Gill, 537 Dexter Ave., Montgomery 4.

Alaska:* *Examination.* Juneau. On application in other towns where there are board members. *Reciprocity.* On application. Sec., Dr. W. M. Whitehead, Box 140, Juneau.

Arkansas:* *Examination. Regular.* Little Rock, June 5-6. Sec., Dr. Joe Verser, Harrisburg. *Homeopathic.* Little Rock, June 10-11. Sec., Dr. Carl S. Bungart, 105 N. 14th St., Fort Smith. *Eclectic.* Little Rock, June 5-6. Sec., Dr. Frank C. Smith, 2301 Broadway, Little Rock.

California: *Written.* San Francisco, June 23-26; Los Angeles, Aug. 18-21; Sacramento, Oct. 20-23. Application must be received at least two weeks prior to date of examination. *Oral for Reciprocity Applicants.* San Francisco, June 21; Los Angeles, Aug. 16; San Francisco, Nov. 8. Applicants are requested not to arrange to come to an oral examination until they receive notice from the Credentials Committee. *Oral and Clinical for Foreign Medical School Graduates.* San Francisco, June 22; Los Angeles, Aug. 17; San Francisco, Nov. 9. Sec., Dr. Frederick N. Scatena, 1020 N St., Sacramento.

Colorado:* *Examination.* Denver, June 10-12. Final date for filing application is May 12. Sec., Dr. Samuel H. Brown, 831 Republic Bldg., Denver.

Delaware: Dover, July 8-10. Sec., Dr. Joseph S. McDaniel, 229 South State St., Dover.

Florida:* *Examination.* Jacksonville, June 29-July 1. Sec., Dr. Homer L. Pearson, 701 Dupont Bldg., Miami.

Georgia: Atlanta and Augusta, June. Sec., Mr. R. C. Coleman, 111 State Capital, Atlanta 3.

Guam: The Commission on Licensure will meet whenever a candidate appears or submits his credentials. Ex. Sec., Dr. Austin W. Matthis, Agana.

Hawaii: *Examination.* Honolulu, July 14-17. Sec., Dr. I. L. Tilden, 1020 Kapiolani St., Honolulu.

Idaho: Boise, July 14-16. Sec., Mr. Armand L. Bird, 305 Sun Bldg., Boise.

Illinois: *Examination.* Chicago, June 24-26 and Oct. 7-9. Supt. of Regis., Mr. Charles F. Kervin, Capitol Bldg., Springfield.

Indiana: Indianapolis, June 1952. Sec., Dr. Paul R. Tindall, 1138 K of P Bldg., Indianapolis 4.

Iowa:* *Examination.* Iowa City, June 9-11. Sec., Dr. M. A. Royal, 506 Fleming Bldg., Des Moines.

Kansas: Kansas City, June 4-5. Sec., Dr. O. W. Davidson, 864 New Brotherhood Bldg., Kansas City.

Kentucky: *Examination.* Louisville, June 3-5. Sec., Dr. Bruce Underwood, 620 S. Third St., Louisville.

Maryland: *Examination.* Baltimore, June 17-20. Sec., Dr. Lewis P. Gundry, 1215 Cathedral St., Baltimore. *Homeopathic.* Baltimore, June 17-18. Sec., Dr. John A. Evans, 6029 Bellona Ave., Baltimore.

Michigan:* *Examination.* June. Sec., Dr. J. E. McIntyre, 100 W. Allegan St., Lansing 8.

Missouri: *Examination.* St. Louis, May 28-29 and June 13-14. *Reciprocity.* May 27. Ex. Sec., Mr. John A. Hailey, Box 4, State Capitol Bldg., Jefferson City.

Nebraska: *Examination.* Omaha, June 16-18. Director, Mr. Husted K. Watson, Bureau of Examining Boards, Room 1009, State Capitol, Lincoln.

New Jersey: *Examination.* Trenton, June 17-20. Sec., Dr. E. S. Hallinger, 28 W. State St., Trenton.

North Carolina: *Written.* Raleigh, June 16-19; *Reciprocity.* Raleigh, June 17. Sec., Dr. Joseph J. Combs, 716 Professional Bldg., Raleigh.

North Dakota: *Examination.* Grand Forks, July 9-11. *Reciprocity.* Grand Forks, July 12. Sec., Dr. C. J. Glaspel, Grafton.

Ohio: *Examination.* Columbus, June 17-20. Sec., Dr. H. M. Platter, 21 W. Broad St., Columbus 15.

Oklahoma:* *Examination.* Oklahoma City, June 4-5. Sec., Dr. Clinton Gallaher, 813 Braniff Bldg., Oklahoma City.

South Dakota:* Rapid City, July 15. Sec., Dr. C. B. McVay, Yankton Clinic, Yankton.

Texas: Fort Worth, June 19-21. Sec., Dr. M. H. Crabb, 1714 Medical Arts Bldg., Fort Worth.

Utah: *Examination.* Salt Lake City, July. Asst. Dir., Mr. Frank E. Lees, 314 State Capitol Bldg., Salt Lake City 1.

Virginia: *Examination.* Richmond, June 12-14. *Reciprocity.* Richmond, June 11. Sec., Dr. K. D. Graves, 631 First St., S.W., Roanoke.

Virgin Islands: St. Thomas, June 4-5. Sec., Dr. Earle M. Rice, St. Thomas.

Washington: Seattle, July. Sec., Mr. Edward C. Dohm, Department of Licenses, Olympia.

Wisconsin:* Milwaukee, July 8-10. Sec., Dr. A. G. Koehler, 46 Washington Blvd., Oshkosh.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

Alaska: *Examination.* On application. Juneau or other towns in Territory as decided by Board. *Reciprocity.* On application. Sec., Dr. C. Earl Albrecht, Box 1931, Juneau.

Florida: Gainesville, June 7. *Examination.* Sec., Mr. M. W. Emmel, Box 340, University of Florida, Gainesville.

Michigan: *Examination.* May. Sec., Miss Eloise LeBeau, 501 W. Michigan Ave., Lansing 15.

Oregon: *Examination.* Portland, June 7, Sept. 6 and Dec. 6. Sec., Dr. Charles D. Byrne, State Board of Higher Education, University of Oregon, Eugene.

South Dakota: Vermillion, June 13-14. Sec., Dr. Gregg M. Evans, 310 E. 15th St., Yankton.

Wisconsin: *Examination.* Milwaukee, June 7 and Sept. 13. Sec., Mr. W. H. Barber, Ripon College, Ripon.

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* Basic Science Certificate required.

MEETINGS

American Medical Association, Chicago, June 9-13. Dr. George F. Lull, 535 North Dearborn St., Chicago 10, Secretary.

American Academy of Pediatrics, Areal Meeting, Hotel Statler, Washington, D. C., May 22-24. Dr. E. H. Christopherson, 636 Church St., Evanstoh, Ill., Executive Secretary.

American Academy of Tuberculosis Physicians, Chicago, June 7. Dr. Oscar S. Levin, P. O. Box 7011, Denver, Secretary.

American Association of Genito-Urinary Surgeons, Seaview Country Club, Absecon, N. J., June 19-21. Dr. Norris J. Heckel, 122 South Michigan Ave., Chicago 3, Secretary.

American Association on Mental Deficiency, Hotel Bellevue-Stratford, Philadelphia, May 26-31. Dr. Neil A. Dayton, P. O. Box 96, Willimantic, Conn., Secretary.

American Blood Irradiation Society, Conrad Hilton Hotel, Chicago, June 7-8. Dr. H. T. Lewis, 5230 Center Ave., Pittsburgh, Secretary.

American Broncho-Esophagological Association, Royal York Hotel, Toronto, Canada, May 20-21. Dr. Edwin N. Broyles, 1100 North Charles St., Baltimore 1, Secretary.

American College of Chest Physicians, Congress Hotel, Chicago, June 5-8. Mr. Murray Kornfeld, 112 East Chestnut St., Chicago, Executive Secretary.

American College of Surgeons, Sectional Meetings:
  Toronto, Canada, Royal York Hotel, May 15-17. Dr. Stuart D. Gordon, 170 St. George St., Toronto 5, Canada, Chairman.

American Diabetes Association, Drake Hotel, Chicago, June 7-8. Dr. J. A. Reed, 11 West 42d St., New York 36, Secretary.

American Geriatrics Society, Hotel LaSalle, Chicago, June 5-7. Dr. Malford W. Thewlis, 25 Mechanic St., Wakefield, R. I., Secretary.

American Gynecological Society, The Homestead, Hot Springs, Va., May 12-14. Dr. John I. Brewer, 104 South Michigan Ave., Chicago, Secretary.

American Hearing Society, Chicago, June 28. Mrs. Francis E. Lee, 817 14th St. N.W., Washington 5, D. C., Secretary.

American Laryngological Association, Royal York Hotel, Toronto, Canada, May 23-24. Dr. Louis H. Clerf, 1530 Locust St., Philadelphia 2, Secretary.

American Laryngological, Rhinological and Otological Society, Royal York Hotel, Toronto, Canada, May 20-22. Dr. C. Stewart Nash, 277 Alexander St., Rochester 7, N. Y., Secretary.

American Medical Women's Association, Chicago, June 8. Dr. Irma Henderson-Smathers, 610 Medical Bldg., Asheville, N. C., Corresponding Secretary.

American Ophthalmological Society, Hot Springs, Va., June 5-7. Dr. Maynard C. Wheeler, 30 West 59th St., New York 19, Secretary.

American Orthopedic Association, London, England, June 30-July 4. Dr. C. Leslie Mitchell, Henry Ford Hospital, Detroit 2, Secretary.

American Otological Society, Royal York Hotel, Toronto, Canada, May 18-19. Dr. John R. Lindsay, 950 East 59th St., Chicago 37, Secretary.

American Proctologic Society, Milwaukee, June 4-7. Dr. Stuart T. Ross, 131 Fulton Ave., Hempstead, L. I., N. Y., Secretary.

American Psychiatric Association, Atlantic City, N. J., May 12-16. Dr. R. Finley Gayle Jr., 6300 Three Chopt Rd., Richmond 21, Va., Secretary.

American Radium Society, Chicago, June 8. Dr. John Wirth, 635 Herkimer St., Pasadena 1, Calif., Secretary.

American Rheumatism Association, Conrad Hilton Hotel, Chicago, June 6-7. Dr. William H. Kammerer, 33 East 61st St., New York 21, Secretary.

American Society for the Study of Sterility, Chicago, June 7-8. Dr. Walter W. Williams, 20 Magnolia Terrace, Springfield 8, Mass., Secretary.

American Therapeutic Society, Blackstone Hotel, Chicago, June 5-8. Dr. Oscar B. Hunter Jr., 915 Nineteenth St. N.W., Washington 6, D. C., Secretary.

American Trudeau Society, Hotel Statler, Boston, May 26. Dr. John D. Steele, 1790 Broadway, New York 19, Secretary.

American Urological Association, Chalfonte-Haddon Hall, Atlantic City, N. J., June 23-26. Dr. Charles H. deT. Shivers, Boardwalk National Arcade Bldg., Atlantic City, N. J., Secretary.

Catholic Hospital Association of the United States and Canada, Cleveland, May 26-29. Rev. John J. Flanagan, S.J., 1438 South Grand Blvd., St. Louis 4, Director.

Georgia, Medical Association of, Atlanta-Biltmore Hotel, Atlanta, May 12-14. Dr. David H. Poer, 875 West Peachtree St. N.E., Atlanta, Secretary.

Idaho State Medical Association, Sun Valley, June 15-18. Dr. Robert S. McKeon, 305 Sun Bldg., Boise, Secretary.

Illinois State Medical Society, Hotel Sherman, Chicago, May 13-15. Dr. Harold M. Camp, 224 South Main St., Monmouth, Secretary.

Maine Medical Association, Samoset Hotel, Rockland, June 22-24. Mr. W. Mayo Payson, 142 High Street, Portland 3, Executive Secretary.

Massachusetts Medical Society, Hotel Statler, Boston, May 19-22. Dr. H. Quimby Gallupe, 22 Fenway, Boston 15, Secretary.

Medical Library Association, Lake Placid Club, Lake Placid, N. Y., June 24-27. Miss Caroline Riechers, 1758 West Harrison St., Chicago 12, Secretary.

Minnesota State Medical Association, Minneapolis, May 26-28. Dr. B. B. Souster, 496 Lowry Medical Arts Bldg., St. Paul 2, Secretary.

Mississippi State Medical Association, Jackson, May 13-15. Mr. Roland B. Kennedy, 508 First Federal Bldg., Jackson, Executive Secretary.

National Tuberculosis Association, Copley Plaza and Statler Hotels, Boston, May 26-30. Mr. Kemp D. Battle, 1790 Broadway, New York 19, Secretary.

Nebraska State Medical Association, Cornhusker Hotel, Lincoln, May 12-15. Dr. R. B. Adams, 1315 Sharp Bldg., Lincoln 8, Secretary.

New Jersey, Medical Society of, Haddon Hall, Atlantic City, May 19-21. Dr. Marcus H. Greifinger, 315 West State St., Trenton 8, Secretary.

New York, Medical Society of the State of, Hotel Statler, New York, May 12-16. Dr. Walter P. Anderton, 292 Madison Ave., New York 17, Secretary.

Ogden Surgical Society, Orpheum Theater, Ogden, Utah, May 21-23. Dr. George M. Fister, Ogden, Utah, President.

Ohio State Medical Association, Cleveland, May 20-22. Mr. Charles S. Nelson, 79 East State St., Columbus 15, Executive Secretary.

Oklahoma State Medical Association, Oklahoma City, May 19-21. Mr. R. H. Graham, 1227 Classen St., Oklahoma City, Executive Secretary.

Society for Investigative Dermatology, Hotel Sherman, Chicago, June 7-8. Dr. Herman Beerman, 255 South 17th St., Philadelphia 3, Secretary.

Society for Vascular Surgery, Chicago, June 8, Dr. George D. Lilly, 331 Ingraham Bldg., Miami 32, Fla., Secretary.

Society of Biological Psychiatry, Hotel Claridge, Atlantic City, N. J., May 11. Dr. George N. Thompson, 1136 West Sixth St., Los Angeles 17, Secretary.

South Carolina Medical Association, Ocean Forest Hotel, Myrtle Beach, May 13-15. Dr. N. B. Heyward, 120 West Cheves St., Florence, Secretary.

South Dakota State Medical Association, Sioux Falls, May 18-20. Dr. L. J. Pankow, 302 First National Bank Bldg., Sioux Falls, Secretary.

Southern Oregon Medical Society, Roseburg, May 13. Dr. F. C. Adams, 1435 Esplanade St., Klamath Falls, Secretary.

The Endocrine Society, Palmer House, Chicago, June 5-7. Dr. Henry H. Turner, 1200 North Walker St., Oklahoma City 3, Secretary.

Upper Peninsula Medical Society, Country Club, Iron Mountain, Mich., June 27-28. Dr. E. Theodore Palm, 412 Superior Ave., Crystal Falls, Mich., Secretary.

Wyoming State Medical Society, Nobel Hotel, Lander, June 5-7. Dr. Glenn W. Koford, 2020 Carey Ave., Cheyenne, Secretary.

INTERNATIONAL

Australasian Medical Congress, Melbourne Victoria, Australia, Aug. 22-30. Dr. C. H. Dickson, Medical Society Hall, 426 Albert St., East Melbourne, Victoria, Australia, General Secretary.

Commonwealth and Empire Health and Tuberculosis Conference, Central Hall, London, England, July 8-13. Dr. J. H. Harley Williams, Tavistock House North, Tavistock Sq., London, W.C.1, England, Secretary General.

Congress of the International Diabetes Federation, Leyden, Netherlands, July 7-12. Dr. F. Gerritzen, 33, Prinsegracht, The Hague, Netherlands, Secretary.

European Congress of Cardiology, University of London, Bloomsbury, W.C.1, England, Sept. 10-12. Dr. K. Shirley Smith, 35 Wimpole St., London, W.1, England, Secretary.

European Society of Cardiovascular Surgery, Strasbourg, France, Oct. 3-4. Sir James Learmonth, Department of Surgery, University New Buildings, Edinburgh 8, Scotland.

Interamerican Cardiological Congress, Buenos Aires, Argentina, Aug. 31-Sept. 7. Dr. Blas Moia, Larrea 1132, Buenos Aires, Argentina, Secretary-General.

Inter-American Congress of Public Health, Havana, Cuba, Sept. 27-Oct. 1. Pan-American Sanitary Bureau, 2001 Connecticut Ave., Washington, D. C.

Inter-American Congress of Radiology, Mexico City, Mexico, Nov. 2-8. Dr. Guido Torres Martinez, Marsella No. 11, Mexico, D.F., Secretary-General.

International College of Surgeons, Madrid, Spain, May 20-24. Dr. Max Thorek, 850 West Irving Park Road, Chicago, Ill., U. S. A., Secretary-General.

International Congress of Acupuncture, Hall of Conferences, Maison du Medecin, Paris, France, May 17-20. Secretariat, 8, Avenue Franklin Roosevelt, Paris, VIIIe, France.

International Congress of Biochemistry, Paris, France, July 21-27. Prof. Jean Courtois, 4, Avenue de l'Observatoire, Paris 6^e, France, Secretary.

International Congress of Dermatology and Syphilology, London, England, July 21-26. Dr. Gordon B. Mitchell-Heggs, 5, Lisle St., London, W.C.2, England, General Secretary.

International Congress of Dietetics, Royal Tropical Institute, Amsterdam, The Netherlands, July 7-11. Miss Diane J. Ten Haaf, Educational Bureau of the Nutritional Council, 42 Koninginnegracht, The Hague, Netherlands, General Secretary.

International Congress on Diseases of the Chest, Rio de Janeiro, Brazil, Aug. 24-30. Mr. Murray Kornfeld, 112 East Chestnut St., Chicago 11, Illinois, Executive Secretary.

International Congress of Haematology, Mar del Plata, Argentina, Sept. 21-26. Dr. Carlos Reussi, Anchorena 1710, Buenos Aires, Argentina, Secretary.

International Congress of Health Technicians, Palais de la Mutualite, Paris, France, June 9-14. Secretariat General, 6 Square Desaix, Paris XV^e, France.

International Congress of the History of Medicine, Nice-Cannes, France, and Monaco, Sept. 8-18. Dr. F. A. Sondervorst, 124 Avenue des Allies, Louvain, Belgium, Secretary-General.

International Congress on Hydatid Diseases, Santiago, Chile, Nov. 21-24. Organizing Committee, P. O. Box 9183, Santiago, Chile.

International Congress of Internal Medicine, Friends House, London, N.W.1, Eng. Sept. 15-18. Sir Harold Boldero, 12 Pall Mall East, London, S.W.1, England, Secretary.

International Congress on Medical Records, London, England, Sept. 7-12. Miss Gwen Perkins, 120 C Street S.E., Washington, D. C., Chairman.

International Congress of Medicine and Sport, Paris, France. May 29-June 1. Prof. Chailley-Bert, 1 rue Lacretelle, Paris 15^e, France, Chairman.

International Congress on Neuropathology, Rome, Italy, Sept. 8-13. Dr. Armando Ferraro, 722 W. 168th St., New York, N. Y., U. S. A., Secretary General.

International Congress of Physical Medicine, London, England, July 14-19. Dr. A. C. Boyle, 45, Lincoln's Inn Fields, London, W.C.2, England, Hon. Secretary.

International Congress of Physiopathology of Animal Reproduction and Artificial Insemination, Copenhagen, Denmark, July 7-10. Prof. Ed. Sorensen, The Royal Veterinary and Agricultural College, Bülowsvej 13, Copenhagen V, Denmark.

International Congress of Urology, The Waldorf-Astoria, New York, N. Y., U. S. A., Sept. 15-18. Dr. John A. Taylor, 2 East 54th St., New York, N. Y., U. S. A., Secretary-General.

International Society of Geographic Pathology, Liège, Belgium, July 15-18. Dr. Fred C. Roulet, Habelstr. 24, Basel, Switzerland, Secretary General.

International Union Against Tuberculosis, Rio de Janeiro, Brazil, Aug. 24-27. Prof. Etienne Bernard, 66 Blvd. St. Michel, Paris 6e, France, Secretary-General.

Neuroradiologic Symposium, Stockholm, Sweden, Sept. 17-20. Docent Ake Lindbom, Symposium Neuroradiologicum, Serafimerlasarettet, Stockholm K., Sweden, Secretary.

Pan-American Congress of Gastroenterology, Mexico City, D.F., May 11-17. Dr. R. Flores-Lopez, Calle Dr. Balmis, No. 148, Mexico City, D.F., Secretary.

World Medical Association, Athens, Greece, Oct. 12-16. Dr. Louis H. Bauer, 2 East 103d St., New York 29, N. Y., Secretary General.

DEATHS

Haden, Russell Landram ⊕ Crozet, Va., since 1942 a member of the Council on Medical Education and Hospitals of the American Medical Association, died in the Cleveland Clinic Hospital, April 26, aged 63, following a subarachnoid hemorrhage. He was in Cleveland participating in the meeting of the American College of Physicians and collapsed following a television broadcast. Dr. Haden was born in Palmyra, Va., May 22, 1888. He obtained the A.B. degree in 1910 and the A.M. degree in 1911 from the University of Virginia. After graduating from Johns Hopkins University School of Medicine, Baltimore, in 1915, and serving as intern and resident house officer at the Johns Hopkins Hospital, he was appointed assistant resident physician and director of laboratories at the Henry Ford Hospital, Detroit. From 1921 to 1923, he was associate professor of medicine at the University of Kansas School of Medicine, Kansas City, Kan., and from 1923 to 1930 was professor of experimental medicine. Dr. Haden joined the Cleveland (Ohio) Clinic as head of the department of medicine in 1930 and retired in 1949. During World War I he was a first lieutenant in the medical corps of the U. S. Army, serving as assistant chief of the medical service, base hospital, Camp Lee, Va. He was secretary of the Section on Pharmacology and Therapeutics of the American Medical Association from 1933 to 1936, vice-chairman, 1936-1937, chairman, 1937-1938 and member of the House of Delegates representing this section during 1939-1940. He was appointed in 1939 to serve as the Association's representative on the Division of Medical Sciences of the National Research Council for a period of three years. At the 1926 annual session of the American Medical Association, Dr. Haden received the Bronze Medal in the Scientific Exhibit for bacteriological study of periapical dental infections; at the 1934 session he received a Certificate of Merit for excellent presentation of an exhibit illustrating the examination of the blood and at the 1941 session a special Certificate of Merit for an exhibit on the origin and early history of the microscope. In 1942, Dr. Haden was appointed a member of the Council on Medical Education and Hospitals for the term ending in 1943, was appointed to a seven-year term in 1943, and was reappointed for a seven-year term in 1950. For the past year Dr. Haden served as chairman of the Council's Conference Committee on Graduate Training in Medicine. He was a specialist certified by the American Board of Internal Medicine, a member of the Central Society of Clinical Research, American Rheumatism Society (formerly known as American Association for the Study and Control of Rheumatic Diseases, of which he had been president in 1936), Association of American Physicians, American Society for Clinical Investigation, American Clinical and Climatological Association, of which he had been vice-president in 1936, American Association of Pathologists and Bacteriologists and the American Society of Clinical Pathologists, serving as vice-president in 1941, and a fellow of the American College of Physicians. Dr. Haden was a member of the Phi Beta Kappa, Sigma Xi, Theta Delta Chi, Nu Sigma Nu, and Alpha Omega Alpha fraternities. In 1929 he was awarded the gold medal by the Radiological Society of North America for contributions to dental roentgenology. He was a consultant in hematology to the Surgeons General of the U. S. Army and Navy, and was appointed medical director of the Red Cross National Blood Program in October, 1950, and was serving in this capacity at the time of his death. He was the author of "Clinical Laboratory Methods," "Dental Infection and Systemic Disease," and "Principles of Hematology," and he contributed numerous articles to medical journals.

Mountin, Joseph W. ⊕ Washington, D. C., chief of the Bureau of State Services of the U. S. Public Health Service, died in the Naval Medical Center, Bethesda, Md., April 26, aged 61. Dr. Mountin was born in Hartford, Wis., Oct. 13, 1891. He received his medical degree from Marquette University School of Medicine, Milwaukee in 1914 and after completing internships at the Milwaukee County Hospital and at the Chicago Lying-In Hospital engaged in graduate study in Boston and New York. He organized and directed the Marquette University Clinic, and then began his career with the Public Health Service during World War I. He was director of the division of public health methods from 1937 to 1939 and of the States Relations Division from 1943 to 1947, when he assumed the post of associate chief of the Bureau of State Services. As chief of the States Relations Division, Dr. Mountin administered the program of federal financial grants-in-aid to the states for public health purposes. During World War II he administered a nationwide emergency health and sanitation program for extracantonment and critical war areas. Two of the major field stations of the Bureau of State Services—the Communicable Disease Center at Atlanta, Ga., and the Arctic Health Research Center at Anchorage, Alaska—were established largely through Dr. Mountin's efforts. A public health service officer for 35 years, he was appointed bureau chief on Nov. 1, 1951, with the rank of assistant surgeon general. He was a member of the intergovernmental committee on aging and geriatrics. Dr. Mountin was vice-chairman of the Section on Preventive and Industrial Medicine and Public Health of the American Medical Association in 1941 and 1942 and chairman in 1943-1944; a member of the Southern Medical Association, of which he was chairman of the public health section, 1935-1936; and a member of the American Public Health Association, serving as secretary of the health officers section, 1934-1935, and as a member of the committee on administrative practice since 1925. He was a specialist certified by the American Board of Preventive Medicine and Public Health, was formerly an instructor of preventive medicine at Vanderbilt University in Nashville, Tenn., and from 1927 to 1931 a special assistant to the commissioner of the Tennessee State Health Department. Dr. Mountin was an adviser to the Bhore Commission of India, a member of the Social Security Mission to Japan, and a member of the technical committee on medical care of the interdepartmental committee of health and welfare. He contributed numerous articles to professional publications.

Alden, George Albert ⊕ Captain, U. S. Navy, retired, Philadelphia; born in Leicester, Vt., in 1891; University of Vermont College of Medicine, Burlington, 1917; commissioned a lieutenant (jg) in the medical corps of the U. S. Naval Reserve on May 19, 1917; transferred to the regular navy in 1918; during most of World War I served as medical officer aboard transports; was senior medical officer aboard the *USS Houston*, which made the presidential cruise to Gallapagos Island with the late President Franklin D. Roosevelt; served in the Washington, D. C., area on three occasions, the first being at the Naval Medical School, then at the Navy's Bureau of Medicine and Surgery, and finally on the Marine Retirement Board; served as executive officer, U. S. Naval Hospital, Portsmouth, Va., and commanding officer, U. S. Naval Hospitals, Bainbridge, Md., and Portsmouth, N. H.; placed on the retired list on Nov. 1, 1950; fellow of the American College of Physicians; pathologist, J. Lewis Crozer Homeopathic Hospital in Chester; died March 17, aged 60, probably of coronary occlusion.

Conklin, Coursen Baxter ⊕ Washington, D. C.; born in Peekskill, N. Y., Feb. 3, 1884; George Washington University School of Medicine, Washington, 1907; clinical professor of medicine at his alma mater; member of the House of Delegates of the American Medical Association from 1944 to 1949; life member and formerly secretary-treasurer of the Medical Society of the District of Columbia and a founder and managing editor of the society's journal; member of the American Academy of Pediatrics; past president and secretary of the Washington Medical and Surgical Society; past president of George Washington University Medical Society; fellow of the American College of Physicians; specialist certified by the American Board of Internal Medicine; served during World War I; associate attend-

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⊕ Indicates Fellow of the American Medical Association.

ing physician, Children's Hospital; consulting pediatrician, Eastern Dispensary and Casualty Hospital; pediatrician, Florence Crittenton Home; died in Doctor's Hospital March 2, aged 68, of arteriosclerotic heart disease.

Agee, James Clarence, Fremont, Neb.; University of Nebraska College of Medicine, Omaha, 1903; died Feb. 25, aged 75, of a heart attack.

Anderson, William Willis ⊕ Atlanta, Ga.; Johns Hopkins University School of Medicine, Baltimore, 1916; associate professor of clinical pediatrics at Emory University School of Medicine; specialist certified by the American Board of Pediatrics; member of the American Academy of Pediatrics; affiliated with Georgia Baptist, Emory (Ga.) University, Grady, and Piedmont hospitals; formerly on the faculty of his alma mater and on the staff of Johns Hopkins Hospital in Baltimore; died Feb. 1, aged 63, of cerebral hemorrhage and arteriosclerosis.

Apperman, Isaac, Brooklyn; University and Bellevue Hospital Medical College, New York, 1920; specialist certified by the American Board of Internal Medicine; member of the Endocrine Society; for many years consultant for the board of health of New York City and the Union Health Center of the International Ladies Garment Workers Union; died in Mount Sinai Hospital, New York, March 16, aged 55, of coronary thrombosis.

Armitage, Clayton Webb, Harbor Beach, Mich.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1892; president of the State Bank; died Feb. 25, aged 84, of uremia.

Armstrong, James Lewis, Brooklyn; New York University Medical College, New York, 1897; died March 15, aged 89.

Arnold, Clifford Hood ⊕ Tucson, Ariz.; Medical College of Virginia, Richmond, 1913; member of the Medical Society of the State of Pennsylvania; on the staff of the Veterans Administration Hospital, where he died Jan. 26, aged 63, of myocardial infarction.

Baehr, Louis Theodore, Madison, Wis.; University of Wisconsin Medical School, Madison, 1943; member of the American Medical Association; served during World War II; resident, State of Wisconsin General Hospital; died March 4, aged 34, of coronary occlusion and duodenal ulcer.

Baerecke, Vida Ziegler, Orange City, Fla.; Woman's Medical College of Baltimore, 1895; died in Deland, Jan. 30, aged 86, of pneumonia.

Bagnall, Loyal Bland ⊕ De Kalb, Ill.; Loyola University School of Medicine, Chicago, 1922; died Dec. 10, aged 64.

Barkley, James Wesley, Belzoni, Miss.; University of Tennessee College of Medicine, Memphis, 1927; member of the American Medical Association; served as vice president of the Delta Medical Society; on the staff of Humphreys County Memorial Hospital; county health officer; died March 7, aged 53, of cirrhosis of the liver.

Barnard, Albert Leroy, Portage Des Sioux, Mo.; Homeopathic Medical College of Missouri, St. Louis, 1896; Barnes Medical College, St. Louis, 1898; died in St. Joseph's Hosptial, St. Charles, Feb. 28, aged 90, as the result of a fall.

Bateman, Jesse Fremont ⊕ Columbus, Ohio; University of Cincinnati College of Medicine, 1928; clinical professor of neurology and psychiatry at Ohio State University College of Medicine; member of the American Psychiatric Association and Central Neuropsychiatric Association; formerly commissioner of the division of mental diseases in the state welfare department; served as secretary of the Ohio State Medical Association; died in Albert Merritt Billings Hospital, Chicago, Dec. 28, aged 54.

Bates, Irby Clyde ⊕ Dothan, Ala.; University of Alabama School of Medicine, 1911; died Feb. 16, aged 64.

Berger, Henry Irving, Indianapolis; University and Bellevue Hospital Medical College, New York, 1908; member of the American Medical Association; on the staffs of Methodist and St. Vincent's hospitals; died Jan. 7, aged 64, of cerebral thrombosis and arteriosclerosis.

Berry, John Walter, Cape Girardeau, Mo.; Barnes Medical College, St. Louis, 1896; member of the American Medical Association; served during World War I; affiliated with Southeast Missouri Hospital; died in Tomahawk, Wis., Feb. 9, aged 80, of myocarditis and chronic nephritis.

Berry, Orland Harley, Bluffs, Ill.; Barnes Medical College, St. Louis, 1905; died in Our Saviour's Hospital, Jacksonville, March 3, aged 72, of carcinoma of the right lung.

Berryhill, William Griffith, Orangeville, Pa.; Baltimore Medical College, 1895; member of the American Medical Association; served during World War I; affiliated with Bloomsburg (Pa.) Hospital; died Feb. 25, aged 85, of carcinoma of the throat and esophagus.

Bibb, James Lewis Leitch ⊕ Chattanooga, Tenn.; University of Virginia Department of Medicine, Charlottesville, 1912; specialist certified by the American Board of Internal Medicine; member of the American College of Chest Physicians; fellow of the American College of Physicians; past president of the Chattanooga-Hamilton County Medical Society; served as chief of staff, Pine Breeze Sanatorium and Baroness Erlanger Hospital; affiliated with Newell Hospital and Memorial Hospital, where he died Feb. 17, aged 66, of coronary occlusion.

Bice, Clyde William ⊕ Oakland, Calif.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1902; died Feb. 27, aged 75.

Bilodeau, Charles Cloudman ⊕ Kalamazoo, Mich.; Columbia University College of Physicians and Surgeons, New York, 1936; died Dec. 5, aged 40.

Bing, William Arthur, West Albany, N. Y.; Albany (N. Y.) Medical College, 1909; formerly superintendent of Montgomery Sanatorium, Amsterdam, N. Y.; died in Albany Hospital, March 11, aged 71, of arteriosclerosis and diabetes mellitus.

Blochowiak, Norbert Paul, Rushford, Minn.; University of Minnesota Medical School, Minneapolis, 1949; member of the American Medical Association; killed Jan. 20, aged 29, when his automobile was struck by a train.

Boland, Thomas Barrett, River Forest, Ill.; Illinois Medical College, Chicago, 1910; member of the American Medical Association; died in Memorial Hospital, New York, Feb. 21, aged 67, of primary carcinoma of the liver.

Bowing, Irwin Ellis ⊕ Kenosha, Wis.; Rush Medical College, Chicago, 1921; specialist certified by the American Board of Radiology; member of the Radiological Society of North America and the American College of Radiology; affiliated with Kenosha and St. Catherine's hospitals; died Feb. 24, aged 59, of cerebral hemorrhage.

Brice, James Arthur, Tarrant, Ala.; Birmingham Medical College, 1913; member of the American Medical Association; died Feb. 24, aged 70, of coronary thrombosis.

Brocke, Alfred, Muskegon, Mich.; National Medical College, Chicago, 1904; died Dec. 26, aged 83, of chronic myocarditis.

Browne, Alfred David, Palo Alto, Calif.; Memphis (Tenn.) Hospital Medical College, 1907; formerly medical and physical education director of universities in North Carolina, Oregon, Florida, and Louisiana; and of Stanford University; died March 6, aged 72, of carcinoma of the stomach.

Coggeshall, Trovalo Chester, Rochelle, Ill.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1904; member of the American Medical Association; served during World War I; died in St. Luke's Hospital, Chicago, March 23, aged 71, of recurrent carcinoma of the colon.

Criss, Clair Carlton, Omaha; Creighton University School of Medicine, Omaha, 1912; chairman of the board of three insurance companies; died March 9, aged 72, of heart disease.

Dickins, William Butts, Greenwood, Miss.; Louisville (Ky.) Medical College, 1896; died in Greenwood-Lefiore Hospital March 16, aged 80.

Graham, Emmet Vance ⊕ Denver; Kentucky School of Medicine, Louisville, 1902; chief medical examiner for the Summit County Draft Board during World War I; at one time practiced in Breckenridge, where he was county coroner; on the staff of Presbyterian Hospital, where he died Jan. 17, aged 81, of carcinoma of the kidney with metastasis.

Grossman, William L. ⊕ North Vernon, Ind.; Illinois Medical College, Chicago, 1907; died Feb. 10, aged 72, of pneumonia, following injuries received in an automobile accident.

Ham, Joseph Gardiner, Portland, Maine; University of Rochester School of Medicine and Dentistry, Rochester, N. Y., 1939; served during World War II; member of the American Medical Association; resident pathologist at Highland Hospital in Rochester, N. Y.; died in Rochester, N. Y., Feb. 11, aged 39, of coronary occlusion.

Harmeyer, Mark Edward, Detroit; Marquette University School of Medicine, Milwaukee, 1935; served during World War II; died in Battle Creek Feb. 17, aged 47, of pulmonary tuberculosis.

Harrell, Bryant Eugene ⊕ Norfolk, Va.; Johns Hopkins University School of Medicine, Baltimore, 1914; specialist certified by the American Board of Urology; member of the American Urological Association; fellow of the American College of Surgeons; past president of the Virginia Urological Society and Norfolk County Medical Society; served during World War I; on the staffs of the De Paul, Norfolk General, and Leigh Memorial hospitals; died Feb. 12, aged 65, of carcinoma of the lung.

Heller, Oscar S., Greenfield, Ind.; Medical College of Indiana, Indianapolis, 1897; member of the American Medical Association; served as county health officer; formerly county coroner and secretary of the board of health of Greenfield; died Feb. 14, aged 79, of cerebral embolus and chronic auricular fibrillation.

Herrin, Frederick Sturgis, Summit, Miss.; Medical College of Alabama, Mobile, 1902; on the staff of the Beacham Memorial Hospital in Magnolia; died Feb. 6, aged 72, of acute coronary occlusion.

Heyser, David Thomas, Atlanta, Ga.; University of Louisville (Ky.) Medical Department, 1909; member of the American Medical Association; died Jan. 30,, aged 65, of aneurysm of the abdominal aorta.

Hoffman, Ira Elmer, North Hollywood, Calif.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1909; formerly medical director of the Washington National Insurance Company, Evanston, Ill.; died Feb. 11, aged 69.

Hood, Arch John, Milwaukee; Jefferson Medical College of Philadelphia, 1918; member of the American Medical Association; served as chief of staff of Milwaukee Hospital; died Feb. 9, aged 60, of coronary arteriosclerosis.

Horger, Edgar Olin, Jr., Greenville, S. C.; Medical College of the State of South Carolina, Charleston, 1937; member of the American Medical Association; served during War World II; died in Jacksonville, Fla., Nov. 26, aged 42, of coronary thrombosis.

Jessup, David Stuart Dodge ⊕ New York; College of Physicians and Surgeons, medical department of Columbia University, New York, 1894; specialist certified by the American Board of Pathology; member of the College of American Pathologists; formerly assistant professor of clinical pathology at his alma mater; affiliated with the New York Eye and Ear Infirmary and St. Luke's Hospital; died in Detroit Feb. 2, aged 82.

Kemp, Milburn Watts, North Madison, Ind.; University of Toronto Faculty of Medicine, Toronto, 1920; member of the American Medical Association and the American Psychiatric Association; served during World War I; superintendent of Madison State Hospital; formerly superintendent of the Anoka (Minn.) State Hospital; died in St. Joseph Infirmary, Louisville, Ky., Feb. 6, aged 57.

Kiley, Joseph Lawrence, Saratoga Springs, N. Y.; Albany (N. Y.) Medical College, 1931; member of the American Medical Association; served as medical supervisor for claims under the county department of public welfare; served during World War II; past president of the staff of the Saratoga Hospital; died Feb. 24, aged 49, or coronary occlusion.

Landes, Edwin Walter, Stillwater, N. J.; Columbia University College of Physicians and Surgeons, New York, 1900; on the staff of the Newton (N. J.) Memorial Hospital; physician at the Sussex County Welfare Home for many years; died Feb. 9, aged 83, of coronary thrombosis.

Lehrfeld, Louis ⊕ Philadelphia; Medico-Chirurgical College of Philadelphia, 1912; specialist certified by the American Board of Ophthalmology; member of the American Academy of Ophthalmology and Otolaryngology; in 1937 resigned as epidemiologist of the Philadelphia Department of Public Health after 22 years' service; served on the staff of Wills Eye Hospital; consultant in ophthalmology, Philadelphia General and Jewish hospitals; died Feb. 6, aged 61, of metastatic carcinoma.

Lombardo, Melchiore, Brooklyn; Regia Università di Napoli Facoltà di Medicina e Chirurgia, Italy, 1900; specialist certified by the American Board of Ophthalmology; member of the American Medical Association and American Academy of Ophthalmology and Otolaryngology; affiliated with Wyckoff Heights and Brooklyn Eye and Ear hospitals; died in Long Island College Hospital Feb. 10, aged 76, of heart failure.

Long, James Walter ⊕ Pittsburgh; Tulane University of Louisiana School of Medicine, New Orleans, 1926; formerly mayor of Port Arthur, Texas; certified by the National Board of Medical Examiners; member of the Industrial Medical Association and the State Medical Association of Texas; served during World Wars I and II; past president of the Jefferson County (Texas) Medical Society; served on the state board of health of Texas; past president of St. Mary's hospital staff in Port Arthur; medical director for the Gulf Oil Corporation; died Feb. 17, aged 52.

Love, John William Pendleton ⊕ Willow Grove, Pa.; University of Pennsylvania School of Medicine, Philadelphia, 1932; specialist certified by the American Board of Pathology; member of the American Society of Clinical Pathologists; fellow of the American College of Physicians; served during World War II; died Nov. 22, aged 45, of glomerulonephritis.

Marvin, Frank William, Marblehead Neck, Mass.; Harvard Medical School, Boston, 1916; served as assistant professor of anesthesiology at Tufts College Medical School in Boston; member of the American Society of Anesthesiologists; specialist certified by the American Board of Anesthesiology; served overseas during World War I; died in Salem (Mass.) Hospital Feb. 3, aged 65, of cerebral hemorrhage.

Miller, Floyd Victor, Delaware, Ohio; Starling-Ohio Medical College, Columbus, 1909; member of the American Medical Association and the American Academy of General Practice; served overseas during World War I and won the Silver Star medal for conspicuous service; died in the University Hospital, Columbus, Dec. 15, aged 68, of sarcoma.

Millen, Lars Johan, Chicago; Bennett Medical College, Chicago, 1911; died March 24, aged 74, of coronary thrombosis and carcinoma of the prostate.

Peeler, Julian Edwin, Woodland, Ga.; University of Georgia Medical Department, Augusta, 1889; died Feb. 14, aged 82, of bronchopneumonia.

Pyle, Charles Consontino, Saltillo, Miss.; Memphis (Tenn.) Hospital Medical College, 1900; died Feb. 13, aged 75.

Smith, William Eugene, Franklin, N. H.; Dartmouth Medical School, Hanover, N. H., 1900; died in Concord Jan. 14, aged 77, of acute renal failure and arteriosclerosis.

Stewart, Oliver Eugene, Arcadia, Calif.; the Hahnemann Medical College and Hospital, Chicago, 1902; member of the American Medical Association; died Dec. 14, aged 77, of pulmonary tuberculosis and hemiplegia.

Stone, Frank P., Laurel Springs, N. J.; Hahnemann Medical College and Hospital of Philadelphia, 1905; member of the American Medical Association; died in Camden Dec. 9, aged 72, of arteriosclerotic heart disease.

Wales, Francis Joseph ⊕ Monroe, Conn.; New York University Medical College, New York, 1897; died Dec. 14, aged 76, of arteriosclerotic heart disease.

GOVERNMENT SERVICES

ARMY

Senior Students Selected for Interns.—Appointment of 146 senior medical students for the military intern program of the Army Medical Service has been announced by the Surgeon General. The program, scheduled to get under way July 1, provides that medical students on graduation can be commissioned as first lieutenants in the Medical Corps Reserve and serve their internships in Army hospitals. The students will be assigned to the 10 Army teaching hospitals in the United States and to Tripler Army Hospital in Hawaii. Ninety-eight of those selected, including the three women in the group, have previously served in the armed forces. In applying, each student was allowed to indicate three hospitals, in order of preference, in which he desired to receive his internship.

AIR FORCE

Aviation Medical Examiners.—The largest class of aviation medical examiners trained at the Air Force School of Aviation Medicine Randolph Field, Texas, since World War II was graduated April 12. This class received the full 11 weeks of instruction. It contained no representatives of foreign air forces and no officers above the rank of captain. Of the 40 captains and 57 first lieutenants, all but six are reserve officers.

Seventeen of the doctors have had previous duty overseas, nine of them during World War II. Three of these were pilots before they studied medicine. Two were bombardiers, and one of them is also a navigator and flight engineer. Their dozen medical specialties range from pediatrics and psychiatry to obstetrics and internal medicine. Two have been certified by specialty boards.

Aviation medical examiners are required to conduct 50 physical examinations for flying and to log 25 hours of flight time in military aircraft before they receive their A. M. E. rating. Their primary duty is to examine cadets, pilots, and air crewmen on flying status. With further study and experience they may qualify as flight surgeons.

DEPARTMENT OF DEFENSE

Armed Forces Medical Library.—The Army Medical Library in Washington, D. C., has recently become the Armed Forces Medical Library by direction of the Secretary of Defense. Now a joint agency of the three military departments, the library will continue to serve both as a national medical library and as the central medical library of the Department of Defense. Subject to the authority, direction, and control of the Secretary of Defense the library will be under the management control of the Secretary of the Army. Its organization will consist of a director, a librarian, an advisory group, and a staff of professional, technical, and clerical personnel.

The director will be an officer selected by the Secretary of the Army, with the approval of the Secretary of Defense, from the medical profession of the Army, Navy, or Air Force. The librarian, a civilian, will be appointed by the director on the recommendation of the advisory group, which will consist of the director, as chairman, a representative from each military department, and not more than five nonmilitary individuals who are prominent either as leaders in medical or health fields or as medical librarians. These civilian members will be appointed by the director, with the approval of the Armed Forces Medical Policy Council. Ordinarily the members will serve no longer than three years, with the exception of the chairman, and their terms will be staggered so that some members will be appointed yearly. In the words of the Secretary of Defense, the library will be dedicated to the advancement of medical sciences in the United States as a whole, as well as within the Department of Defense.

VETERANS ADMINISTRATION

Grants for Wheel Chair Homes.—Grants have been made to 2,272 seriously disabled veterans, including those of the Korean conflict, for "wheelchair" homes, the Veterans Administration announced. The grants total nearly 20.5 million dollars. Another 1,656 veterans have received preliminary approval for such grants.

All veterans of war or peacetime service since 1898 who can not maneuver without the aid of wheel chairs, braces, crutches, canes, or the like may be entitled to these special grants. These veterans must be entitled to compensation for permanent and total service-connected disability for the loss, or loss of use, of both legs due to certain specified conditions.

VA defrays 50% of the cost of "wheelchair" homes for eligible veterans up to a maximum of $10,000 under grants first authorized by Congress in 1948. These homes incorporate such special features as ramps, doorways wide enough to accommodate a wheel chair, special bathroom fixtures, and exercise rooms equipped to meet the needs of the individual persons. The veteran may use the grant in several ways. He may buy a lot and build on it, remodel his present home to suit his needs, or apply the grant against his mortgage if he already has a suitable home.

Residencies Available.—The Crile Veterans Administration Hospital of Cleveland announces that there are openings for residents in ophthalmology, orthopedic surgery, pathology, physical medicine rehabilitation, thoracic surgery, and radiology. The physical medicine rehabilitation residency includes a program of physical therapy, corrective therapy, occupational therapy, educational therapy, and industrial art. A recently opened section for the care of paraplegic patients is also under the department of physical medicine rehabilitation. The stipends range from $2,640 to $3,300 per annum. For information write to Dr. Joseph T. Wearn, Chairman, Dean's Committee, Western Reserve University School of Medicine, 2065 Adelbert Rd., Cleveland 6, Ohio, or to Dr. Leon Ross, Chief, Professional Services, Veterans Administration Hospital, 7300 York Rd., Cleveland 29, Ohio.

Several vacancies for residents in internal medicine, neurosurgery, pathology, physical medicine, and psychiatry, beginning July 1, 1952, are available at the Veterans Administration Hospital, 2002 Holcombe Blvd., Houston 31, Texas. Interested physicians should write to Dr. Warren T. Brown, Chairman of the Dean's Committee, Baylor University College of Medicine, Houston, Texas, or to the Chairman of the Resident Review Board, Veterans Administration Hospital, 2002 Holcombe Blvd., Houston, Texas.

MISCELLANEOUS

Forty-one Grants in Support of Basic Research.—The National Science Foundation has announced approval of 41 research grants, totaling $406,660, in the biological and physical sciences. This is the second group of research awards to be announced this year under the foundation's program for the support of basic research, bringing the total number of announced foundation research grants to 69. Additional proposals are being evaluated by the staff of the foundation with the help of advisory panels of outstanding American scientists. The research fields included are biochemistry, biophysics, chemistry, comparative physiology, developmental biology, endocrinology, engineering, enzyme chemistry, experimental plant biology, genetics, microbiology, oceanography, physics, pharmacology, and systematic biology. The duration of research grants in this group ranges from 1 to 5 years. The average grant amounts to $9,919 per year. The research grants were approved by the National Science Board upon the recommendation of Dr. Alan T. Waterman, director of the foundation.

FOREIGN LETTERS

BOLIVIA

Hospital Facilities in Bolivia.—In a survey recently carried out by the Departamento Nacional de Bioestadística (Vital Statistics Department) and the division of planning and evaluation of programs of the Servicio Cooperativ Interamericano de Salud Pública, it was found that Bolivia has the following hospital facilities. There are 4,860 hospital beds (government and private) for a total population of 3,091,031, or 1.5 beds per 1,000 inhabitants. Because of the inadequate number of hospital beds, many patients with contagious diseases are treated in their homes or continue with their ordinary activities. Of the total number of beds, the government has 3,799 in 37 hospitals distributed throughout the republic, and the private organizations have 1,061..

Maternal and child health facilities include 362 beds in government hospitals for children and pregnant women. On the other hand, the private hospitals devote about one-half of their capacity to pregnant women and only a few beds to children; the remaining beds are for surgical patients. At present, several government hospitals are being constructed; among them are the following institutions: the Children's Hospital in La Paz, 200 beds; the Tuberculosis Hospital, 200 beds; and the Hospital Obrero (Hospital for Laborers), 240 beds.

There are 727 physicians in the country; this means, theoretically, one physician for every 4,215 inhabitants; however, almost all the physicians are concentrated in the urban areas, and two-thirds of the Bolivian population live in the rural areas. There are 259 dentists and 70 registered midwives in the republic.

International Health Meetings of Bolivia, Peru and Chile.—On May 26, 1946, under the sponsorship of the Pan-American Sanitary Bureau, the governments of Bolivia, Peru, and Chile agreed to discuss their common health problems periodically. The first meeting was held in Arica, a Chilean port in the Pacific, located on the crossroads between Bolivia, Peru, and Chile. Malaria, yellow fever, exanthematous typhus, smallpox, and plague were scheduled for permanent periodic discussions, because they are prevalent diseases in two of the three countries concerned.

During the second meeting, which was held in Arica, in February, 1951, each delegate reported the activities of his country.

During the second week of March, 1952, the third international health meeting was held in La Paz. The following delegates were present: Drs. Amador Neghme and Rene Sotomayor from Chile; Dr. Carlos Quiroz from Perú; Drs. Néstor Orihuela, George Bevier, Nemesio Torres, and Luis Gallardo from Bolivia, and Dr. Osvaldo Da Silva from the Pan-American Sanitary Bureau, World Health Organization (W. H. O.) regional office (Lima). Along with the yearly reports given by each delegate, the use of DDT and gamma benzene hexachloride (gammexane) for mosquito control and the use of warfarin for the control of rats was discussed. Among the main recommendations agreed upon, were: (*a*) intensification of the smallpox vaccination, giving preference to the use of the desiccated vaccine in the tropical areas, (*b*) compulsory vaccination for yellow fever, (*c*) control of Aedes aegypti, and (*d*) intensification of the lice control. The Chilean delegation suggested to the Peruvian delegation that there be an integrated malaria campaign in the valleys of Caplina and Sama, which are close to their frontiers. A meeting of the three ministers of health some time this year was recommended in order to adapt the agreements of the three countries to the main lines of the international sanitary code.

It is planned that the next meeting will be held in La Paz, April 7, 1953, after a preliminary meeting in Tacna (Perú). Trypanosomiasis American (Chagas disease) has been included as one of the subjects for discussion for the coming meeting along with the diseases already mentioned. Finally, it was suggested that rabies be studied as a public health menace in each country. Depending on the findings, rabies may be considered as another subject for discussion.

ITALY

Vertebral Fracture Caused by Electric Shock Therapy.—At a meeting of the Italian Society of Neurology, held in Volterra under the chairmanship of Professor Zalla, Dr. Mugnai called attention to the danger of electric shock therapy, stressing vertebral fracture, which is not sufficiently emphasized in Italian literature. On the basis of the one case that he observed and of foreign statistics, he advocated a systematic roentgenographic investigation of the spinal cord in patients treated with electric shock therapy, so that the rate of spine complications in this method of treatment can be established. His report resulted in an important discussion in which many physicians attending the meeting participated.

Professor Sarteschi, from Pisa, asserted that in his clinic, during a five year period, fractures were rare; there was only one fracture in 30,000 electric shock treatments. He concluded that it is not advisable to repeat electric shock treatment in patients in whom a vertebral fracture has occurred. Professor Ferrari, from Genoa, observed only a few vertebral fractures during electric shock therapy in the neurological clinic of Genoa. He concluded that such low numbers, in opposition to the foreign statistics, do not justify, from his point of view, the omission of electric shock therapy when it is indicated; only when extensive and evident alterations are shown by roentgenograms should this treatment be omitted. Professor Sarteschi, from Volterra, never observed vertebral fractures in the many thousands of electric shocks performed at his hospital. In his patients, he observed fractures and dislocations of the upper extremities. Professor Salotti, a radiologist from Florence, said that a preventive radiological investigation of the spinal cord is useful as a guide, but it should never constitute a factor influencing the omission of electric shock therapy.

Society of Medical Culture.—At a meeting of the Society of Medical Culture of Novara, held under the chairmanship of Professor Vittorio Leigheb, Drs. Ferrero and Bossi discussed a case of thrombosis of the left common carotid artery in a 50-year-old man in whom arterial pressure was normal and who, for three months, had had right side hemiplegia and atoxic aphasia of gradual onset. Encephalography according to Bingel's method revealed a left ventricular block, and further investigations revealed thrombosis of the left common carotid artery. The case presented some peculiar neurological aspects, especially the impossibility of performing arteriography of the left carotid artery, whereas, as a rule, thrombosis of the internal carotid artery is more frequent and can be detected by arteriography. The patient was operated on; the occluded portion of the carotid artery was opened; and a long thrombus was removed. A late but obvious improvement in the patient's neurological condition was observed.

Drs. Martelli and Pisani reported the case of a 57-year-old patient who was admitted to the hospital with Jacksonian attacks in the right side of the body. Encephalography revealed a slight, symmetrical hydrocephalus, whereas the roentgenographic examination of the skull revealed prominence of the diploic vessels of the left side, caused by an angioma of the left cerebral hemisphere. After roentgen therapy to the affected area, the Jacksonian attacks disappeared for about one year and then reappeared but with intervals between attacks longer than the previous ones. After many months, the patient was readmitted to the hospital with severe subarachnoid hemorrhage. Angiography of the carotid artery, performed immediately after the attack, revealed an excessively large angiomatous process that had developed mainly in the left temporoparietal region. Because of the enormous size of the angioma and its localization on the left side, an operation was not performed. It was revealed that when he was 12 years old, the patient had suffered an injury in the left parietal region that had resulted in right side hemiplegia of short duration. About 10 years after the injury, the first Jacksonian attacks were observed. According to the speakers,

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The items in these letters are contributed by regular correspondents in the various foreign countries.

the trauma was responsible for the angioma, although, as a rule, this morbid entity is considered to be congenital.

Dr. Menapace discussed diphtheria, with special reference to the changes brought about by vaccination with toxoid. Diphtheria is a common disease in Italy, and its gravity is more pronounced than other infectious diseases. The study of its epidemiology shows a characteristic seasonal course with the peak in the fall. On the basis of a statistical study of 2,378 patients with diphtheria admitted to the hospital of Novara from 1943 to 1946, the speaker observed that the war brought great changes in the epidemiology of diphtheria, and this makes it difficult to judge the usefulness of vaccination with toxoid. This was seen by comparing these data with data for an equal length of time before 1939. The increased incidence among adults is certainly caused by changes brought about by the war.

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LONDON

Voluntary Service and the State.—The National Council of Social Service and the King Edward's Hospital Fund for London has just published a report entitled "Voluntary Service and The State," which summarizes the results of an inquiry carried out for "the future of voluntary service in the new hospital service." The report is divided in three sections: (1) voluntary service in hospital administration; (2) voluntary service to the sick and infirm; and (3) voluntary funds. The present organization of the national hospital service in England and Wales provides for the country being divided in 14 regions, each containing a university medical school and administered by a regional hospital board. The chairman and members of these boards are directly appointed by the minister of health, who, in making the appointments, is required to consult various bodies, including local authorities and representatives of the former voluntary hospitals, the universities, and the medical profession. Within each region the hospitals are divided into conveniently administered groups, each of which is administered by a hospital management committee, of which there total 378. The chairman and members of these hospital management committees are appointed by the regional hospital boards. The teaching hospitals are grouped separately, and each teaching hospital group (of which there are 24 in London and 12 in the provinces) is administered by a board of governors, the chairman of which is appointed by the minister of health.

The authors of the report are convinced that the maintenance of voluntary service is essential to the success of the National Health Service. "The committees of this country are democracy at work. . . . Committee administration may be cumbersome and slow, but it is an effective barrier to tyranny, not only the tyranny of totalitarianism but also the lesser tyranny of bureaucracy." Two conditions are essential to the successful operation of the new hospital service. One is that the minister of health shall trust the regional hospital boards and hospital management committees. The other is that "these Boards and Committees shall undertake their work with a clear appreciation of their relative functions and with a full sense of responsibility." It is pointed out that although the original intention of the minister was clear, that the regional hospital boards should "guide and control the planning, conduct and development of the services in their area," the tendency has been for the boards to become "primarily administrative bodies standing between the Ministry and the Management Committee and exercising functions which appear to exceed those of an overseer." This tendency is strongly deprecated. "The greatest danger" to the success of the service is "the tendency of the central authority to regard the voluntary boards and committees not as partners with them in the administration of the service but as their unpaid servants." The relationship of principal and agent is very different from the relationship of master and servant, and the administration can be effective only if the voluntary partners are allowed and encouraged to have wills of their own and a substantial measure of individual authority. The difficulties involved in reconciling central direction with decentralized executive authority are fully appreciated. Superficially there is much to be said in favor of paid officials as opposed to committees, but "a committee can provide a consensus of opinion, perspective and objectivity, all of which are of value. It also provides a safeguard against the ill-effects of bureaucratic control: this would become increasingly important since experience seems to indicate that an increase in public administration tends to produce an officiousness in minor office and some decline in courtesy to the public."

The section on voluntary service to the sick and infirm provides a full review of the present scope of such service. It is pointed out that when the National Health Service was introduced in 1948 there was an immediate decline in the amount of voluntary service. It was soon realized, however, that such service was still required. Indeed, the report states that "at the present time, although there is a national health service financed almost entirely from public funds, there is more voluntary service given to the sick and infirm than ever before." In hospitals for the acutely sick these activities include auxiliary nurses, ward orderlies, the repairing of hospital linen and patients' clothing, visiting of patients, and advice to patients on legal and financial matters. Then there are portable stores from which patients can purchase things, library services, and entertainments. A specialized form of voluntary service, which has become of increasing importance during recent years, is in connection with the blood transfusion service, where the services provided include recruiting donors, managing publicity, enrolling donors, preparing for bleeding sessions, serving meals to staff and tea to donors, and assisting with clerical work.

All these services in hospitals for the acutely sick are also available in hospitals for the chronically sick, but there the problems involved are more complex and the demand for voluntary services more adamant, because in the past they have been relatively neglected. Many of the problems involved are concerned with geriatrics. Part of the difficulty is the dismal and depressing condition of many of the buildings in which such hospitals are housed. Thus, valuable voluntary services in this type of hospital include reading to partially blind patients, helping to feed those who have difficulty in feeding themselves, and arranging outings for those who are able to leave the hospital for a few hours.

Tuberculosis hospitals and sanatoriums present similar opportunities for voluntary service. An interesting example of what can be done in this connection is the "Friends of Kelling." This is an organization founded in 1948 by three patients after being discharged from Kelling Sanatorium in Norfolk. The aim of the organization is "to mobilise, encourage, foster and maintain the interest of the public in the patients of Kelling Sanatoria and the support of the work of the Sanatoria by voluntary service." Each year an entire week is devoted to raising money for the purpose. The full support of the sanatorium staff, the management committee, and the local community has been obtained, and the amenities provided include a film projector, toys for the children, competitions, entertainments, and garden parties. In the words of the report, "all these activities have brought the outside world into the hospital and have given the patients constant friendship and interest, and zest for living."

Voluntary services outside the hospitals are equally comprehensive. They include home helps, "sitter-ups," transport for patients and relatives to and from the hospital, mobile kitchens, mobile physiotherapy units to make physiotherapy available to patients in outlying districts who would be unable to get to a hospital for such treatment, and "Darby and Joan" clubs for old people. In addition, many of the convalescent homes of the country are run by voluntary societies.

Two specialized forms of voluntary service outside the hospital are worthy of fuller notice. One is the "Scunthorpe Remedial Recreational Club" in Lincolnshire, which was founded by the orthopedic surgeon and the almoner at Scunthorpe Hospital, for "the resocialisation of the sick and injured by the activities of a club of which they hold temporary membership." The club has a membership of about 50 children and adults of whom one-half have had poliomyelitis. The club meets twice weekly, once in a gymnasium and once at the local swimming bath. In this way the members are rehabilitated physically, mentally, and socially, and here become more easily adjusted to normal living conditions. Temporary membership is insisted upon, no matter how long the period of disability, as the prime aim of the club is to be "a bridge between the hospital environment and normal society."

The other is the "Chesire Foundation Home for the Sick," so-named after the "flying ace" of World War II who founded it to provide "a home for sick people for whose special needs the national health service could not provide, and who had nowhere else to go." The original home was in Hampshire; it housed 32 patients, whose ages ranged from 18 to 92. A second home has been opened in Cornwall. The only patients excluded are those with tuberculosis. The home is intended to be similar to a family home, and both staff and patients live a community life, helping each other to the best of their ability. It is believed to be "the only home that provides for the young chronic sick the opportunity to lead as normal life as they are able to lead, with all the nursing care that they need." Patients pay fees, but these cover only a fraction of the cost of running the home.

The main conclusions of the report are epitomized in the following quotations: "The partnership of the State and voluntary service in the administration of hospitals is, in our view, a courageous and imaginative experiment. . . . There is no doubt in our minds that voluntary service in the hospital, and to the sick and infirm outside the hospital, must continue and must be expanded. . . . We believe that the "voluntary spirit" that inspires voluntary service is something that is of the essence of greatness in man, and that a nation that fails to make use of this gift can never be a great nation."

PARIS

Conference on BCG.—On Dec. 8, 1951, the French Society for Tuberculosis organized a special conference on BCG. Dr. Courcoux, chief editor of the *Journal of the French Society for Tuberculosis* and Drs. Duret, Choubrac, and Le Menager cited two comparative sets of statistics on the pupils at a school for health visitors, especially in regard to exposure to tuberculosis. Of 88 allergic pupils not vaccinated from 1935 to 1942, 23 had tubercular manifestations, of which 3 were fatal; of 155 pupils, anergic but vaccinated, from 1943 to 1951, only 1 had pleurisy. Drs. Fourestier, Baïssette, Bergeron, and Gonzalès stated the results of vaccination in the town of Montreuil (near Paris). In this city, primary infection showed a decrease from 5.5% in 1948 to 2.73% in 1950, for persons from 0 to 19 years old. In the suburbs of this city, where no BCG vaccinations were given, primary infection increased from 6.03% in 1948 to 14.08% in 1950. In Montreuil, the tuberculosis chart (not including primary infection) of persons in the same age group showed a decrease from 1.13 to 0.97% from 1948 to 1950. Professors Gernez-Rieux, Gervous, Ramon, and Jacquet (Lille) stated the results obtained in vaccinating 15,000 children in the northern district since 1947. The authors insisted that fresh vaccines yielded the same results as dried ones. A comparison between 6,920 persons vaccinated more than two years ago and a control group of 2,130 persons who had negative skin tests in 1949 and who had not been vaccinated showed a pleurisy incidence of 0.57 per 1,000 in vaccinated persons in contrast to 1.40 per 1,000 in the control group. There were enlarged hilar nodes in 0.43 per 1,000 of vaccinated persons in contrast to 10.32 per 1,000 in the control group. In regard to BCG, the authors recommended the scarification process for very young persons and intradermal vaccination for adolescents and adults. Drs. Dufour and Despierres (Lyons) emphasized the risk incurred in vaccinating persons a short time after primary infection and the absolute necessity of isolating, before vaccination, persons who were in contact with others with positive sputa. Maclouf (Paris) explained that the administration of BCG in aerosols allows a large dispersion of the vaccine and thus avoids the concentration of bacilli at a single point. It is interesting to note that anergic adolescents vaccinated with this method had no local or general reactions; on the other hand, the operator experienced allergic reactions for a long time. He had a high temperature, vomiting, and headache, and density at the apex of the right field was found at radiography; this disappeared after rest.

SWEDEN

The Prognosis for Cancer of the Breast.—Figures recently quoted by Dr. Hugo Rosenqvist show the approximate survival-rate for patients with various types of cancer of the breast, who undergo radiological and operative treatment as practiced at Radiumhemmet and the Caroline Hospital (Karolinska Sjukhuset) in Stockholm. Of 1,014 patients treated at these hospitals, 80% could be regarded as operable. The survival-rate after five years was 79.1% for the 418 patients with cases in stage 1 and 46.4% for the 539 patients with cases in stage 2. The survival-rate for the two stages together was 60.5%. It should be noted that stage 2 included the patients in whom there were metastases to the axilla at the time of operation. Included among the 1,014 cases were 57 that were so advanced that they had to be relegated to stage 3. They were, however, given operative treatment for various reasons. Most of these 57 cases terminated fatally within three years.

Dr. Rosenqvist calculates that 1,700 patients with cancer of the breast are operated on every year in Sweden. He also calculates that, considering how many cases are inoperable from the outset, about 1,000 women die every year of cancer of the breast in Sweden. Yet there has been considerable improvement with regard to the early recognition of the disease. It was shown by Dr. Nyström in 1922, that 30% of the patients consulting a physician for cancer of the breast did so within six months after suspecting it. This rate has risen to 70%. Even so, only about one-third of the cases discovered at present show no signs of metastases. Recent dissections of the intercostal spaces showed that metastases to the parasternal glands occur earlier than was thought. This process is favored by the location of the cancer near the midline, a fact that helps explain why the prognosis is worse for the median cancers than for the lateral cancers of the breast. These dissections proved that invasion of the supraclavicular fossa by metastases often occurred before involvement of the glands in this area was clinically demonstrable. As judged by the findings of these dissections, 15% of the cases hitherto regarded as belonging to stage 1 and 40% to stage 2 really belong to stage 3 and by the same token should be regarded as inoperable. In discussing exploratory excisions when in doubt, Dr. Rosenqvist argues in favor of them as an indispensable aid to early diagnosis.

Lessons from Mass Radiography.—A mass radiography campaign conducted in the town of Norrköping in 1947 and 1948 has yielded some valuable information, which has been collected and sifted by Dr. Ragnar Frölinder for the benefit of other workers in this field. Everyone in the town over 7 years of age was invited to undergo a radiographic examination, and over 61,000 persons accepted this invitation. There were, however, between 7,000 and 8,000 persons, who, for various valid reasons, were exempted from this examination, and there were 2,972 who absented themselves for unknown reasons. There was refusal to participate in this examination of 0.9% of the total. The most wholehearted support of the campaign came from the large industrial concerns and public services, whereas persons working at home and members of the upper classes were less inclined to respond. Although there was a majority of women in the town, there were 2,000 fewer women than men undergoing this examination. It seems that the woman working at home was the least likely to be interested in the examination.

It is usually assumed that persons with cases of tuberculosis discovered by mass radiography often come from homes with a family history of tuberculosis. But in this instance, as many as 120 of 151 persons with definite pulmonary tuberculosis were found to belong to families in which tuberculosis had hitherto been unknown. Dr. Frölinder compared the number of new cases of pulmonary tuberculosis notified year by year before this campaign with the number of cases notified after it. During the years 1942 to 1946, there was an average of 100 such new cases yearly. After this campaign, only 37 new cases were notified in 1949. In 1950, there were 57 such cases, and, in 1951, there were 60 such cases. It seems that the effect of mass radiography dwindles with the lapse of time following it.

CORRESPONDENCE

DOCTORS' ART SHOW CANCELLED

To the Editor:—Through factors beyond their control—mostly financial, owing to lack of a sponsor this year—the board of directors of the American Physicians Art Association have decided to cancel the A. P. A. A. art show in Chicago and plan for a big show in New York the following year.

Because of this cancellation, I deeply regret we will not be able to hold an art banquet next June. I hope you will understand the predicament in which the A. P. A. A. is placed without a sponsor to help meet our expenses so that we are forced to cancel our art activities at the next A. M. A. convention.

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OLD TERMS AND MODERN CONCEPTS IN MEDICINE

To the Editor:—Because terms reflect concepts, there is a danger that the persistence of obsolete terms in our language may perpetuate outworn concepts. Among such terms are some that imply a categorical distinction no longer considered valid, as, for example, "functional etiology" versus "organic etiology," "functional process" versus "organic process," or "functional disease" versus "organic disease."

According to older concepts, a disease is organic, anatomic, or structural, if a gross or microscopic "lesion" can be identified by visual methods of examination. Today there is a general awareness that most anatomic lesions depend upon a series of functional changes. The diphtheritic membrane, for example, which chokes its victim, is composed chiefly of the victim's own fibrin. The consolidation in the lungs of the patient with pneumonia comes from his own body's reactions to the invading microbe, which include vasodilation, exudation, and the mobilization and concentration of leukocytes. These changes do not represent the depredations of the pneumococcus so much as they reflect functional adaptations by the host. Similarly, the manifestations of many other diseases stem from the patient's own adaptive processes. Hence the terms functional and structural are descriptive of different phases in a process and do not imply that the bodily disorders are categorically different.

Such phrases as "the effect of the mind on the body" and "emotional origin" are similarly inexact and misleading, since not only intangible stresses but many of the tangible ones produce their bodily effects or diseases through the mediation of the highest levels of the central nervous system. Thus the nausea that follows a whiff of rotten egg vapor must be brought about through pathways in the forebrain. This would not be referred to as "the effect of the mind on the body." It is rather the effect of the rotten egg on the body. Since bodily mechanisms that require the presence of the cerebral cortex are functions integrated at the highest neural levels, the phrase "highly integrated response" may be more useful and is certainly more meaningful than the oft heard "psychogenic reaction."

One may thus think of highly integrated functions in the same biologic terms with which one considers more localized reactions and responses on a segmental reflex level. Recent studies have emphasized the fact that a variety of stressful experiences may be damaging to the human organism, some of the noxious stimuli acting more or less directly, others largely indirectly. When stressful qualities of an experience depend upon its significance to the individual, the reaction is mediated through the highest (cortical) level. Such a process of work by the neurons in the brain is certainly as physical as the manufacture of urine by the kidneys.

Recent work suggests that certain bodily disorders and diseases may include in their mechanism the interpretive function of the brain. Study of such highly integrated patterns of reaction in man requires a comprehensive view of the human organism and its aims and goals. This type of study has not been popular; recently, in fact, it has been considered in some quarters to be unscientific. To call this unscientific would be the same as saying that a study of water and its properties would be less scientific than a study of the constituents, hydrogen and oxygen. To such early physiologists as Claude Bernard, it was scientific and highly desirable, and Bernard found it possible to focus his interest on a study of the behavior and habits of highly differentiated man. Shortly thereafter, the discoveries of Louis Pasteur at once widened and narrowed the horizon of investigators. Bernard predicted that the best brains in medicine would become diverted to the study of the behavior and habits of the not very highly differentiated bacteria. This trend took place and was followed in the history of medicine by the work of such great German physiologists as Karl Ludwig on the functions of isolated organs. Even in the recent past an experimental study was considered most highly satisfactory if the organ in question could be isolated almost completely from the influence of the organism's highest integrative activity. One might as well approach the study of water by isolating and scrutinizing hydrogen. Consistent progress in medicine today depends, as always, on changing methods and concepts, and clarity of thinking requires that worn out concepts be discarded together with the clichés that serve them. The breadth of view necessary to progress in medicine involves not only the consideration of the whole patient but the development of the "whole doctor."

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LYSOZYME AND ULCERATIVE COLITIS

To the Editor:—A letter published in The Journal, March 29, 1952, on lysozyme and ulcerative colitis aroused my interest. I agree with the author in that lysozyme probably does not play an etiologically significant role in ulcerative colitis; however, this assumption has not yet been conclusively demonstrated. The results obtained in the cauterization experiments lack statistical significance with respect to increased lysozyme titers. Further, the method used to determine lysozyme in these cauterization experiments as well as in most lysozyme studies of ulcerative colitis employs arbitrary lysozyme units varying in definition from investigator to investigator. A comparison of results between different laboratories is impossible. The method used is indicative of a rather wide range in the amount of lysozyme present. It would have been far better to measure lysozyme quantitatively in metric units (micrograms) as is accomplished by the method of Smolelis and Hartsell (*J. Bact.* 58:732, 1949) modified by Lobstein and Fogelson for gastric contents (*Quart. Bull., Northwestern Univ. M. School* **25**:89, 1951; *Am. J. Digest Dis.* **18**:298, 1951) and for whole blood (Lobstein, Ross, and Fogelson, to be published). I wish to add that lysozyme does not seem to play an etiologically significant role in peptic ulcer either (Lobstein, Hull, and Fogelson, *Gastroenterology* **20**:474, 1952).

May I also remind the reader, first, that crystalline egg-white lysozyme, the lysozyme from cauterized animals, and the lysozyme of excreta in ulcerative colitis are not necessarily identical, and, second, that what happens in animals need not happen in man. It is well known that dogs are quite different from man with respect to resistance of the gastrointestinal tract to ulcerations and that the composition of the secretions of the gastrointestinal tract is also different. What appears to be normal or low in animals may be high for man or vice versa. It is therefore misleading to make such comparisons.

Experiments performed in this laboratory on dogs with total colon pouches (unpublished data, 1950), in which these pouches were transfused with (1) solutions of crystalline egg-white lysozyme, and (2) the "lysozyme" active fractions of stools from human ulcerative colitis patients, all gave negative results. Neither series produced any pathologically demonstrable lesions, but it would have been erroneous to conclude that similar experiments in man would have given similar results.

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ADDISON'S DISEASE DUE TO METASTATIC BRONCHOGENIC CARCINOMA

To the Editor:—In their article on Addison's Disease in bronchogenic carcinoma published in The Journal, March 1, page 729, Drs. Wallach and Scharfman stated that they failed to find in American literature "any confirmed case report of Addison's disease due to replacement of adrenal tissue by tumor." A case of this kind was reported by me in my monograph on primary carcinoma of the lungs published in 1932 and later in my book on bronchogenic carcinoma and adenoma published in 1948. It concerned a man of 53 whose illness of about two years' duration was characterized by steady loss of weight, asthenia, anorexia, hypotension, and pigmentation of the skin and mucosa of the roof of the mouth. On a few occasions he was disoriented. Members of the hospital staff who were familiar with the silent or inapparent type of bronchogenic cancer keenly searched the lungs to no avail. The physical examination, except for a nontender tumefaction in the region of the left kidney, was normal, as was the roentgen ray study. The clinical diagnosis was Addison's disease.

At the postmortem examination, a minute bronchial cancer, at first overlooked, was disclosed when it became apparent that both adrenals had been destroyed by cancer and not by tuberculosis.

With the frequency of metastases to the adrenals from a bronchogenic cancer there is little doubt that the incidence of Addison's syndrome caused by a neoplastic metastasis is less rare than physicians would have us believe. It is overlooked because attention is directed to the pulmonary cancer, which is considered accountable for the symptoms.

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DRUG RESISTANT TUBERCLE BACILLI FROM PATIENTS TREATED WITH ISONICOTINIC ACID HYDRAZIDES

To the Editor:—Many glowing reports of the early beneficial effects of the isonicotinic acid hydrazides ("rimifon," "nydrazid," and "marsilid") in patients with tuberculosis have appeared in newspapers and magazines as well as in the medical journals. Little has been mentioned, however, about the emergence of drug resistant tubercle bacilli in the sputum of patients treated with these drugs. Since one of the major drawbacks to the use of streptomycin alone in pulmonary tuberculosis proved to be the rapid emergence of streptomycin resistant strains of tubercle bacilli, and this regardless of the dosage, it is important to determine as soon as possible whether the same situation will arise during therapy with the isonicotinic acid hydrazides.

Six patients began to receive isonicotinic acid hydrazide ("rimifon") or its isopropyl derivative ("marsilid") on Jan. 18, 1952. All had chronic cavitary pulmonary tuberculosis that had not responded satisfactorily to previous treatment, including streptomycin and *p*-aminosalicylic acid. Weekly 72 hour sputum samples were digested with sodium hydroxide and concentrated, and from this material Gaffky counts and cultures for isonicotinic acid hydrazide sensitivity were made. Definite evidence of increased bacillary resistance was noted in three of the six patients after seven weeks of treatment. In one patient, the first indication of increasing resistance was apparent after 26 days. An initial fall in the Gaffky count of these three patients was followed by a rise at a time corresponding closely to the onset of increased bacillary resistance. After 11 weeks of treatment these three patients, as well as a fourth whose cultures have not as yet shown any resistance, show sputum bacillary counts as high or higher than when they began treatment. Just prior to treatment, one patient had negative sputum smears and cultures despite the presence of pulmonary cavitation. After six weeks of "marsilid" therapy a positive culture was obtained, and the recovered bacilli showed a resistance to "marsilid" greater than that of any pretreatment culture so far tested. In only one of the six patients has the sputum converted to negative by culture.

Thus it is apparent that drug resistant strains of tubercle bacilli may emerge rapidly in patients with chronic pulmonary cavitary tuberculosis during therapy with the isonicotinic acid hydrazides and that the appearance of such strains may be followed closely by bacteriologic relapse. In the light of these observations it may be predicted that the use of these drugs alone in patients with this type of disease may result in only temporary benefit, and that, if isonicotinic acid hydrazide resistance proves to be long-lasting, it may prejudice the chance of future response to therapy with a combination of isonicotinic acid hydrazide and another drug, or surgical procedure, or both. The observations referred to in this letter will be published in detail in the near future.

Further investigation should logically proceed along the line of a search for methods to delay or prevent the emergence of resistant organisms.

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TRANSMISSION OF LEUKEMIC AGENT FROM PARENTS TO OFFSPRING IN MICE

To the Editor:—In describing the results of recent studies on mouse leukemia carried out in this laboratory (*J. A. M. A.* **148**:746 [March 1] 1952) experiments referring to the transmission of the leukemic agent from parents to offspring were designated as "tests . . . of the possibility of transplacental transmission of the leukemic agent." This statement referred to a series of experiments in which, as a result of the inoculation of the leukemic agent into suckling infant mice of a nonleukemic line, in not only the inoculated animals did leukemia develop but later on also in 48% of their untreated offspring (Gross, L.: *Proc. Soc. Exper. Biol. & Med.* **78**:342, 1951). These experiments suggest that the leukemic agent is transmitted from the inoculated parents to their offspring; the question remains open, however, how such transmission may occur.

The possibility of transmission of the leukemic agent from mothers to their offspring through the milk has been excluded by experiments demonstrating that foster nursing did not prevent the development of leukemia in mice of a leukemic inbred line (MacDowell, E. C., and Richter, M. N.: *Arch. Path.* **20**:709 [Nov.] 1935). Transplacental transmission, however, is not the only remaining explanation to be considered; it is also possible to assume that the leukemic agent may be passed from one generation to another directly through the germinal cells, *i. e.*, through the fertilized ovum.

Current experiments carried out in this laboratory suggest that the leukemic agent is present in normal testicular tissue as well as in normal ovaries of young healthy mice of the leukemic Ak line. The possibility must therefore be considered that in mice of the leukemic strain the sperm as well as the ovum may contain the leukemic agent and may carry it directly into the fetus. The embryo developing from such an infected ovum may thus carry the leukemic agent from the time of conception, as in the case of chicken lymphomatosis.

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COUNCIL ON MEDICAL SERVICE

MEDICAL CARE FOR THE INDIGENT

A little over a year ago the Committee on Indigent Care[1] of the Council on Medical Service undertook two projects. The first was a general survey of the status of medical care programs for the indigent and medically indigent in the United States. The second consisted of specific studies of a limited number of state and local programs.

GENERAL SURVEY

The purpose of the general survey was to provide the committee with an over-all view of the various types of medical care programs now in operation, to show something of the variations in approaches to this problem, and to discover to what extent medical societies officially participate in such programs.

Questionnaires were sent to all state medical associations and to 125 local medical societies. A summary of such programs in the 48 states reveals that in 31 states the medical care of the indigent is a county, municipality, or township responsibility and that 14 states have what might be considered statewide programs. Most of these, however, are administered locally.

The survey indicates that there are few organized medical care programs for the indigent and medically indigent. State governments generally limit their efforts in this field to defining indigency, to authorizing local governmental units to care for the indigent, and to participating in financing the care of special public assistance groups. Despite the increased emphasis on so-called social security, the free services of family physicians and of hospital staff members are still the principal source of medical care for this group of persons.

Hospital care is generally available to both the indigent and the medically indigent in government hospitals, in hospitals affiliated with teaching centers and, of course, in many private hospitals. Surgery and in-hospital medical care are equally available, with physicians usually giving freely of their services as staff members. Little effort seems to be made to allow a free choice of physician.

Specialists' services are generally available to the indigent, and to a lesser degree to the medically indigent, in outpatient clinics of many hospitals and in special clinics operated by health departments. Here, again, there is little free choice of physician, with the physicians providing their services gratis or at a small retainer or hourly rate.

Few programs specifically provide home and office care for the indigent. In any event physicians often give their services to individual patients without compensation. Where such programs do exist, it is frequently the medical society that has promoted the idea and is making the program work. A number of county societies contract with the county officials for the services of the society members; others provide a panel of names from which the client may select a physician. Several societies administer the entire program; others act only in an advisory capacity.

From the data collected to date it is evident that medical societies, both state and county, must interest themselves in this problem. Adequate home and office care programs have been developed only where the medical societies have actively participated in the planning and operation.

THE SPECIFIC STUDIES

On completion of the general survey the committee undertook a series of specific studies of various types of indigent medical care programs. For this purpose 12 communities and 4 states have been selected, each with a different kind of program. The primary interests of the committee are the types and number of medical services available to indigent persons and the degree of physician participation in such programs. Consequently, the studies have been directed toward obtaining information and data that will enable the committee to evaluate the programs and to make recommendations as to medical society participation.

The studies are concerned with two general groups of persons: (1) those on general assistance programs, including the relief and medically indigent, and (2) those on public assistance programs, including the old age pensioners, the dependent children, the blind, and the permanently and totally disabled.

General Assistance.—Although social welfare laws differ greatly from state to state, the development of these laws seems to have a common background. They were developed to provide the basic necessities of life to persons not able to support themselves. These persons are referred to by a variety of terms, such as general assistance cases, relief cases, or just the indigent. Few state or city laws demanded the inclusion of medical care in the subsistence benefits for this group, and it has been through "interpretation" that medical service has become and is now generally included as one of the basic necessities.

Along with this provision of subsistence and medical care for relief cases it became apparent that many persons could maintain themselves as long as no sickness developed in the family. In other words, these persons could provide the basic necessities for their own subsistence, with the exception of medical care, and are known as the "medically indigent." These two groups comprise the general assistance cases and are accepted as the responsibility of local governments.

Public Assistance.—Over the years a number of states created special programs to meet the needs of particular groups such as the blind, the aged, and children. These special programs were given impetus by the federal government in 1935 through the Social Security Act. This act created three categories for which federal funds would be available to states, provided the states complied with such federal regulations as were set forth. The three categories or groups are: old age assistance, aid to dependent children, and aid to the blind. In 1949 a fourth group was added under the title, aid to the permanently and totally disabled. Persons who fall within these four groups or categories are referred to as public assistance cases, as opposed to the relief or general assistance cases. The costs of public assistance are shared by the local, state, and federal governments, while costs of general assistance are local or local-state shared.

Old age assistance can be granted to persons 65 years of age or older who are in need. The amount they receive and the determination of a person's eligibility rests with the state as it does in all the categories. Aid to Dependent Children provides aid to children under 16 years of age or up to 18 years of age, if they are in school. These are children who are orphaned or otherwise lose parental support and are living with relatives or legal guardians. Funds are granted to the guardians of these children. To receive assistance under the aid of the blind category, a person must have not better than 10% of normal vision corrected. This is the smallest category numerically. The permanently and totally disabled category provides aid for those who cannot support themselves because of physical incapabilities that are permanent in nature.

The federal share for old age assistance, aid to the blind, and permanently and totally disabled is four-fifths of the first $25 of the state's average monthly payment, plus one-half of the next $10, plus one-third of the remainder, with a maximum of $50 on each category. This means a state would be reimbursed $30 from the federal government for a $50 allotment check to persons receiving old age assistance or aid to the blind, or to permanently and totally disabled clients. Administrative costs are shared equally by state and federal governments.

In aid to dependent children cases, the federal government will share three-fourths of the first $12 and one-half of the remainder, with a maximum of $27 per first child per month. An $18 maximum is imposed on subsequent children in the same house. Administrative costs are also shared equally by state and federal governments for this category.

A major change made in social security administration by the 1949 amendment involves the method of payment for services. Originally, no federal funds could be used to pay physicians or hospitals directly for care of persons on one of the public assistance programs. All federal monies had to be paid to the public assistance client. At present, however, the states may pay the vendor of medical service directly and still receive federal matching.

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[1] Committee members: Drs. H. B. Mulholland, Chairman, Charlottesville, Va.; A. J. Bowles, Seattle; E. P. Coleman, Canton, Ill.; J. H. Howard, Bridgeport, Conn.; E. A. Ockuly, Toledo, Ohio; Dean W. Roberts, Baltimore; and Roscoe C. Webb, Minneapolis.

In review, the four categories receiving aid with federal monetary support are old age assistance (O. A. A.), aid to dependent children (A. D. C.), aid to the blind (A. B.), and aid to the permanently and totally disabled (P. T. D.). These four groups make up the public assistance categorical cases. The two groups supported primarily from local funds are the relief and medically indigent cases and are to be termed general assistance cases. These terms and abbreviations will be used in the reports on indigent programs reported on here and in subsequent issues of THE JOURNAL.

INDIGENT MEDICAL CARE IN ERIE COUNTY (BUFFALO) NEW YORK

This report will consider Erie County, New York, as the study unit. The population of Erie County is approximately 800,000, of which 575,000 persons are in the city of Buffalo. Erie County is chiefly an industrial area, with both light and heavy industry well represented. Farming is also a source of wealth for the county but comparatively few of the county's population are thus employed.

ELIGIBLE POPULATION

Approximately 16,770 persons in Erie County, or about 2% of the population, receive aid during the average month under one or more of the public assistance or general assistance programs. The number of persons in each program is as follows:

General assistance and medically indigent	5,300
Public assistance	
Old age assistance	6,100
Aid to dependent children	3,200
Aid to blind	170
Permanently and totally disabled	900
Crippled children	1,100

All of the above groups are eligible for the same medical care benefits. Certification as to eligibility for medical care is handled by the department of social welfare, with each case investigated to determine the program for which the person qualifies. Each case worker is assigned to a given geographical area and serves all programs. Once eligibility for care under one of the programs is determined, it is maintained as part of a continuing process under regular case worker supervision.

ADMINISTRATION

The board of supervisors of Erie County, an elected body, appoints a board of social welfare. This board, in turn, appoints a commissioner of welfare to head the department of social welfare, the agency responsible at the county level for all persons receiving aid under any program. This department determines eligibility and does the planning for all clients, subject to approval by the state department of social welfare.

Within the county society welfare department is a medical division headed by a full-time physician and employing seven part-time physicians. It is the function of this division to check all bills and to review the diagnoses and therapy connected with the bills. The medical division also reviews each special procedure to ascertain its advisability. In addition to the review of bills and treatment, provision is made for remedying any abuses that may be found. In case of abuse, the physician or client is notified, depending on which of the two is at fault, and the matter is usually settled within the medical division. If a client is not satisfied with the decision, he has a right to appeal to the state board of welfare for a "fair hearing," as provided under federal law. The physician, in turn, may appeal to the medical director or to the county medical society.

The department of social welfare also has a hospital division, which investigates and arranges hospitalization for nonrelief (medically indigent) cases, as well as a dental division, responsible for arranging for dental care. Hospitalization of active relief cases is under the direction of the individual relief units.

SERVICES AVAILABLE

All health services are potentially available to anyone on any of the programs. Each person is treated according to his needs, whether his is an aid to the blind case or a medical relief case. Furthermore, there is no time lag between the request and receipt of most services.

Home and office calls by physicians are on a free choice basis; however, even though office calls are allowed, clients are urged to use the clinic services whenever possible. In emergencies a client calls a physician and identifies himself as an aid case. The physician is free to accept or refuse the case. If the client has difficulty in getting a physician or if he knows of no physician to call, he may contact his case worker, who will provide a list of four or five physicians.

Although the county maintains its own hospital, all clients have a free choice of hospital and may have their own physician attend them during their hospital stay. The need for hospitalization in emergencies is determined by the attending physician, and the patient may go to the hospital immediately. In cases that do not constitute emergencies, application is made through the medical division.

Outpatient care is available in the nine general hospital clinics to persons on any program. These clinics are partially supported by the county board of supervisors; therefore, when clients use them, the costs are not charged to the social welfare department's budget. Physiotherapy is available at any time in the outpatient clinics and with special permission may be obtained in a private physician's office. Nursing care in the home is available for all clients through the Visiting Nurses Association but must be authorized by the medical division.

Drugs requiring prescriptions may be obtained at the pharmacy of choice, provided they do not exceed $5.00; if they cost over $5.00 the physician writing the prescription must receive prior authorization from the social welfare department. In emergencies, physicians are expected to provide such medicines as are necessary from their medicine bags.

Diagnostic laboratory services are available in the Erie County Laboratory and may be used by any physician. The laboratory is located in the E. J. Meyer Memorial Hospital and does the clinical and pathological studies for the hospital.

Convalescent care is provided in private nursing homes and in the County convalescent home. Eyeglasses are provided on prescription of a specialist. Special appliances are also supplied when prescribed by a physician and approved by the medical division. Ambulance service is maintained and provided by the various hospitals as a part of their regular services. Clients are entitled to a choice of dentists, or they may go to dental units in the outpatient departments of the hospitals. An official health education program is operated by the health department of Erie, and both preventive medicine and health education are emphasized by the case workers.

Prior authorization, which means being enrolled on an aid program, is necessary for the benefits described. If a person who is not on one of the programs needs a physician and is given service, the physician must collect from the patient or assume the loss. There is no provision for reimbursing the physician who cares for a private patient who is unable to pay, even though that patient may be a relief client the next day. In other words, neither certification nor payment can be made retroactive.

Special Program.—Erie County has a special county home and infirmary care program for individuals, except persons with mental disease, who need medical care and supervision on a long-term basis. It is available to persons on assistance programs as well as to those who do not qualify for a government program and yet are definitely in need of care. The home has a census of approximately 900 persons, with a special building set aside for persons under 50 years of age to aid them psychologically in their rehabilitation.

The program is administered by the department of social welfare, and its costs are charged against the budget of the department. Financial status as well as need for care determines eligibility. This program costs Erie County approximately $75 a month for both medical and supervisory care, or $44 per month for supervisory care alone.

PROVIDERS OF SERVICE

All licensed physicians in the county are eligible to participate in the welfare program. No written agreement is necessary. The physician treats the welfare patient as he does a private patient. Approximately 600 of the 1,400 physicians in Erie County submit bills regularly; however, more than 600 participate, since prescriptions written by other physicians are presented for payment even though they do not submit a personal bill for services rendered.

The nine general hospitals provide both hospitalization and outpatient clinic services to the welfare clients. The number of beds in each of these hospitals is given in the following tabulation.

The E. J. Meyer Memorial (County)	858
Allied Hospital of the Sisters of Charity	722
Deaconess	277
Lafayette General	63
Mercy	325
Millard Fillmore	473
St. Francis	53
Our Lady of Victory	229
Buffalo General	448

The Buffalo General Hospital has a large pediatrics clinic, and the health department operates well-baby, prenatal, chest, venereal disease, and orthopedic clinics. All health department clinics are staffed by physicians on an hourly basis. Clients of all programs are eligible to attend any of these clinics. Forty-five nursing homes participate in providing convalescent care. Patients may have their own physicians in these homes, but not if they go to the county convalescent home.

PAYMENT FOR SERVICES

Physicians are paid directly by the local department of social welfare at the rate of $2.00 for an office call and $3.00 per home call. There is also a general fee schedule agreed to by the department of social welfare and the Erie County Medical Society. The schedule covers obstetrics, minor surgery, x-ray, and fractures and dislocations. The fees are approximately 50% of the Workmen's Compensation Fee Schedule.

A specialist on consultation in cases "not amenable to treatment by a general practitioner" receives $4.00 per office or home visit. He must be referred to the case by the attending physician or by the physicians in the medical division of the department of social welfare. Such referrals are usually made only in areas where clinics are not easily accessible.

A flat rate of $11.75 per day is paid to the hospitals. This is an all-inclusive rate paid to all hospitals handling public assistance cases and comes from state and county funds. In the general assistance cases, the county alone pays for services. If a patient who is not on an assistance program is admitted to a hospital, the hospital social workers make a financial investigation. The person is asked to pay $2.50, $5.00, $7.50, or $11.75 (full rate), or may be declared eligible for free service as a staff case, depending on the result of this investigation.

Public funds are not available for in-hospital medical and surgical care; therefore, physicians are not paid for staff cases and may not be paid for the part-pay cases mentioned above in any of the nine general hospitals.

Nursing service provided by the Visiting Nurses Association is paid for at the rate of $2.15 per visit. Nursing homes are paid at the rate of $110 per month if they provide more than custodial care, while $90 a month is paid to those which provide only supervision. A person must have a medical recommendation to qualify for convalescent home care.

COSTS AND FINANCIAL SUPPORT

The medical services of Erie County indigent cases are financed by tax funds from federal, state, and county governments. The funds provided have generally been sufficient to carry out the program in its entirety. The total cost for medical care for all programs for an average month (April, 1951) was $168,072. The costs by program are shown in the table.

The cost figures given in the table should be considered as samples or estimates, since the number of persons on the rolls of each program changes constantly. It is evident, however, that the cost of hospital services is considerably greater than the cost of physician services. Much of this cost difference is undoubtedly due to the fact that physicians are not paid for in-hospital medical care.

Appropriations are made annually and are based on the previous year's experience. Since the funds for indigent medical care come within a departmental budget, an emergency grant may be procured should the appropriation prove inadequate.

THE MEDICAL DIRECTOR OF ERIE COUNTY

After World War II, the large population increase in townships adjacent to Buffalo brought about new problems in the welfare field. The Erie County board of supervisors saw that raising the level of medical care and providing complete service was impractical on a township by township basis. It was agreed that improving medical care for welfare clients could best be accomplished by merging all medical services into a single county plan. On July 1, 1946, the New York State Legislature acted to permit such mergers, and Erie County took immediate advantage of the new law to reorganize its indigent care program. In the course of this reorganization certain units and positions were abolished and new ones created. The Buffalo City Hospital became the E. J. Meyer Memorial (County) Hospital; the Erie county department of charities and correction was dissolved, and its functions were assigned to the department of social welfare, thus expanding this department to a county basis. The health departments of surrounding communities were incorporated in a county health department. The position of county physician and the position of medical consultant to the city department of social welfare were abolished, and a new position created, titled "Erie county medical director."

Medical-Hospital Care, Erie County, April, 1951

		Cost per Person			Total Cost		
Programs	No. Persons Eligible	Hospital	Physicians and Drugs	Total	Hospital	Physicians and Drugs	Total
Aid to Blind	170	$2.84	$2.34	$5.18	$ 483	$ 397	$ 880
Aid to Disabled	927	5.70	0.71	6.41	5,283	660	5,913
A. D. C.	3,210	2.71	1.24	3.95	8,697	3,972	12,669
O. A. A.	6,060	3.73	2.01	5.74	22,618	12,188	34,806
Home Relief *	5,284	19.87	1.66	21.53	105,005	8,769	113,774
					$142,086	$25,986	$168,072

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* This is the program for the indigent and medically indigent and also includes county infirmary cases described under Special Programs.

The purpose of the reorganization was to create an office that could coordinate Erie County's various medical activities, avoid duplication and overlapping of services and provide professional guidance to the total medical care program. This is done by the medical director and his staff. He is the liaison officer between the department and all agencies or agents providing medical care. He attends meetings of the medical society, the board of social welfare, the board of managers or laboratory, and the Meyer Hospital's board of managers. The seven part-time physicians working under the medical director are given the title "medical investigators." These men act as medical advisors to the social work staff and interview all clients with medical problems. In addition, they call at the various hospitals to review the medical histories and charts of hospitalized clients and thus prepare themselves to discuss the cases with the social work staff. The success of the Erie County plan is due in no small degree to the capable administrator who is now Erie County medical director.

MEDICAL SOCIETY RELATIONSHIP

The medical society of the county of Erie plays an important though unofficial part in the indigent medical care program. The medical director is a member of the medical economics committee of the society, and the society has a spokesman, who is a physician, on the Erie County board of social welfare to represent the medical viewpoint. The society works closely with the medical division not only in urging physicians to participate but in formulating medical policies and in developing rules, procedures, and the fee schedule; for example, by agreement between the Erie County welfare department and the Erie County medical society, all medical service by physicians in hospitals is rendered without charge. This agreement is based on the fact that the University of Buffalo has a medical school that uses the various hospitals as teaching units and, therefore, needs staff cases for teaching purposes.

Another interesting example is the limitation of free choice of physician agreed to by the medical society and the social welfare department. Free choice is restricted only to the extent that (1) if the medical division questions the adequacy of care by the individual physician, the division may direct the client to go to a hospital clinic for complete medical examination, and (2) patients in hospitals are to be cared for without pay or are placed under the care of the physician or surgeon on service at the time.

Every member of the medical society is provided with an outline showing clearly how he can participate and the services that are available to him and to the welfare patient. These outlines of procedure and policy have the approval of the medical society and simplify physician cooperation.

SUMMARY

Medical care for welfare recipients in Erie County is provided through a well-coordinated and complete service program. While it depends to some degree on the liberality of New York State laws for its organization, its successful operation is the result of a close and continued cooperation between all of the agencies and groups involved. Administration is entirely local and provides for adequate medical supervision and direction.

The Erie County department of social welfare administers all health care services as a unified program. All persons who qualify as welfare recipients are permitted the same services and the same facilities. Overlapping services and duplication of effort, two bugaboos of good administration, are practically nonexistent. Certification is handled by qualified case workers, each of whom has responsibility for all welfare recipients in a given area. Since all recipients may have the same privileges, there is no scrambling from one group to another in order to obtain special medical services. Further, a relief client has potentially available to him every medical service that can be provided in the county of Erie.

The medical division of the department of social welfare occupies a unique position in medical care administration. In reviewing and approving all bills for medical service, it serves as a protection against abuses by either physicians or recipients. Its authority to decide what, if any, special services a person needs makes it possible for every case to be considered on an individual basis. Direction of the division by a physician and an adequate staff of physicians assures the program of medical supervision and of the professional viewpoint so necessary to sound planning and administration.

The attitude of the medical society toward the county welfare program and the relationship between the society and the medical division assures the recipients of high quality medical care. The interests of those who are ill, of the general public, and of the physicians whose services are used in the program are all considered in relation to each other so that each gains as a result. Control measures are necessary to prevent abuse of the program and are accepted in a spirit of cooperation and good will.

One goal of this comprehensive program is rehabilitation, and any service will be authorized that the medical division believes will aid in returning the client to a normal life, whether it be as a worker or as a housewife. It is obvious that one-time costs that will return a man to work are much more economical than long-term care. While this is not a new concept, it is usually found on paper and rarely, as here, in operation.

The Erie County indigent medical care plan accomplishes the primary objective of any such plan. It makes available to the indigent sick all of the medical, hospital, and related services available to other citizens of the community and does this with a minimum of disturbance in the normal physician-patient relationship. Further, it has succeeded in partially compensating private physicians on a fee basis and in utilizing all available facilities, private and public, at a minimum of cost to the taxpayer.

BUREAU OF LEGAL MEDICINE AND LEGISLATION

MEDICOLEGAL ABSTRACTS

Income Taxes: Kickbacks, As "Ordinary and Necessary" Business Expense.—The Commissioner of Internal Revenue refused to allow the petitioners to deduct the payment of kickbacks to physicians as "ordinary and necessary" business expenses under the income tax law. The action of the Commissioner was upheld by the tax court and the United States Court of Appeals, Fourth Circuit, (Lilly et al., v. Commissioner of Internal Revenue, 188 F. [2d] 269 [1951]; J. A. M. A. 147:1298 [No. 24] 1951) so the petitioners appealed to the Supreme Court of the United States.

The petitioners were engaged in the business of grinding, fitting, and selling eyeglasses and spectacles. They entered into oral contracts with various oculists whereby petitioners agreed to pay the oculists one-third of the retail price of all eyeglasses and spectacles purchased by patients sent to them by the oculists. The evidence shows that the oculists did not regularly inform their patients of this rebate arrangement, but such a disclosure was made only when it was specifically requested by individual patients. The sole issue in the case, as considered by the Court of Appeals, was whether or not these rebates paid by the petitioners to the oculists were deductible as "ordinary and necessary" business expenses.

The facts are not in dispute said the Supreme Court. The payments to the oculists were made by petitioners monthly in the regular course of their business. Under the long-established practice in the optical industry in the localities where the petitioners did business, these payments, in 1943 and 1944, were normal, usual, and customary in size and character. The transactions from which they rose were of common or frequent occurrence in the type of business involved. They reflected a nationwide practice. Consequently, they were "ordinary" in the generally accepted meaning of that word.

The payments likewise were "necessary" in the generally accepted meaning of that word. It was through making such payments that petitioners had been able to establish their business. Discontinuance of the payments could have meant, in 1943 or 1944, the oculists reference of their patients to other opticians who did share profits with them. Several oculists testified that they had recommended petitioners and the petitioners' competitor, the American Optical Company, both of which were sharing profits with the oculists on substantially the same basis. If either had stopped making the payments while the other continued them, there is no reason to doubt that the oculists thereafter would have omitted their recommendation of the nonpaying optician.

The tax court in the instant case made no finding of fact that the payments to the oculists were not ordinary and necessary business expenses. It sustained the commissioner's disallowance of their deductibility, because it held that, as a matter of law, the contracts under which the payments were made violated public policy.

Assuming for the sake of argument that business expenditures that are ordinary and necessary in the generally accepted meaning of these words may not be deductible as "ordinary and necessary" expenses when they "frustrate sharply defined national or state policies proscribing certain types of conduct"; nevertheless, the expenditures now before us do not fall into that class said the Supreme Court. The policies frustrated must be national or state policies evidenced by some governmental declaration of them. In 1943 and 1944, there were no such declared public policies proscribing the payments that were made by petitioners to the oculists.

Customs and the action of organized professional organizations have an appropriate place in determining what are ordinary and necessary expenses at a given time and place; for example, they materially affect competitive standards that determine whether certain expenditures are in fact ordinary and necessary. Evidence of them is admissible on that issue. They do not, however, in themselves constitute the "sharply defined national or state policies" the frustration of which may, as a matter of law, preclude the deductibility of an expense under the income tax law.

"We voice no approval of the business ethics or public policy involved in the payments now before us," the court concluded.

Accordingly, the judgment of the court of appeals was reversed and the cause remanded to the tax court with directions to set aside its judgment insofar as it is inconsistent with this opinion. *Lilly v. Commissioner of Internal Revnue, 72 S. Ct. 497 (1951).*

Pharmacy Schools: Classification by Private Association.—The plaintiff filed a petition for a writ of mandamus to compel the respondent, Florida State Board of Pharmacy, to permit Abraham Newman to take the state pharmacy examination. From an order of the trial court granting the writ, the respondent appealed to the Supreme Court of Florida.

The evidence indicated that Newman was over the age of 21 years old and of good moral character and was licensed to practice pharmacy in both New York and Connecticut. He graduated from Fordham College of Pharmacy in 1930. At that time, Fordham was not a member of the American Association of Colleges of Pharmacy, but it became a member in 1939, and has remained a member ever since. The sole question presented for determination, said the court, is whether the petitioner has complied with the statute by showing that he is ". . . a graduate of an 'accredited school or college or pharmacy holding membership in the American Association of Colleges of Pharmacy and accredited by said board of pharmacy.'"

A construction of this language presents some difficulty, said the court. It is the duty of the court to, if possible, ascribe to the language used a meaning that will not cause the statute to be unconstitutional. The word "accredited" and the phrase "accredited by said board of pharmacy" cannot be held to vest in the Florida State Board of Pharmacy an unlimited and uncontrolled discretion in determining which schools will be accepted as "accredited" without rendering the act invalid. The statute provides no standard that a college must attain to be accredited by the board, unless such standard be found in the phrase "such school or college of pharmacy holding membership in the American Association of Colleges of Pharmacy."

Membership in a voluntary association, which may be denied at the whim of the association or declined at the pleasure of the school, the court continued, is in no sense a reasonable basis for determining the proficiency of the graduates of an institution. If the phrase be construed as ambulatory, the statute to that extent is unconstitutional. The respondents admit that the statute cannot be construed as ambulatory in prospect but urge that it be so construed as to relate to those institutions that were members of the association when the act became effective and were also members of the association at the time this particular applicant received his diploma. This would make the statute more logical, the court admitted, but there is nothing in the language used by the legislature that would justify the court in holding this statute ambulatory in retrospect and not ambulatory in prospect.

The only construction that this court can place on the statute as written, which does not offend the constitution, concluded the Supreme Court, is that the phrase "such school or college of pharmacy holding membership in the American Association of Colleges of Pharmacy" constitutes a definition of an "accredited" school and must be construed as being fixed as of the date of the enactment of this statute, so that, in reality the statute constitutes a legislative determination that those schools that were on the membership rolls of this association at that time are designated as "accredited" just as if each such school had been designated by name in this statute. Adopting this construction, said the court, the statute as applied to Newman could be paraphrased to require an applicant to be "a graduate of one of the following schools . . . Fordham College of Pharmacy. . . ." Since the petitioner is admittedly a graduate of Fordham, his right to take the examination is clear. Accordingly, the writ of mandamus, directing that Newman be admitted to the examination, was affirmed. *Attwood et al. v. State ex rel. Newman, 53 So. (2d) 825 (Florida, 1951).*

MEDICAL MOTION PICTURES

NEW FILMS ADDED TO A. M. A. LIBRARY

Functional Anatomy of the Hand: 16 mm., color, sound, showing time 28 minutes. Produced in 1951 by Duke University, Department of Anatomy, Durham, North Carolina. Procurable on loan (service charge $1.00) from Committee on Medical Motion Pictures, American Medical Association, 535 North Dearborn Street, Chicago 10, or National Foundation for Infantile Paralysis, 120 Broadway, New York 5.

The film graphically depicts normal function of the muscles of the hand and forearm as well as the relation of the muscles to the skeletal structure. To demonstrate function, the arm has been dissected so that wires could be attached to individual muscles and their operation shown either individually or in groups. To depict the relation of the muscles to the skeletal structure, each muscle as it is described by the narrator is positioned in its proper place on the skeleton. This film is remarkable for the extremely clever dissection, which enables the anatomist to work the individual tendons of the wrist and fingers, and for the adroit use of a mirror whereby the same movement is viewed from two aspects at once.

The photography is satisfactory; however, the overlay labels are very poor and somewhat distracting. The picture is long, and it may be advisable to show it in sections. A 16-page brochure is sent with each copy of the film, and it is important that the teacher read this booklet before the picture is used in classroom situations. It can be recommended for orthopedic surgeons, medical students, physical therapists, and occupational therapists.

The Quiet One: 16 mm., black and white, sound, showing time 66 minutes. Produced in 1948 by Film Documents, New York. Procurable on loan (service charge $8.00) from Committee on Medical Motion Pictures, American Medical Association, 535 North Dearborn Street, Chicago 10.

This film portrays the story of a 10-year-old boy who had the misfortune to be born into a family that resented his existence and left him to shift for himself. It vividly shows the hopeless struggle that builds up in the mind of a child continually denied the feeling of being wanted and how he eventually drifts into delinquency. The child is sent to a correction school for wayward boys staffed by experienced counselors under the direction of a psychiatrist. The job of emotional rehabilitation is what makes this film so fascinating to students of human behavior. The groups who might profit from this film are medical students or residents in pediatrics or psychiatry, persons connected with child care institutions as staff or volunteer workers, social workers and nurses preparing for public health work or pediatrics, and teachers working with retarded children.

The complete review of this film can be found in THE JOURNAL (**145**:110 [Jan. 13] 1951) or in "Reviews of Medical Motion Pictures," 1951 supplement, page 11.

Breakdown: 16 mm., black and white, sound, showing time 42 minutes. Produced in 1951 for the Mental Health Authorities of the Provinces of Canada by the National Film Board of Canada. Procurable on loan (service charge $3.00) from Committee on Medical Motion Pictures, American Medical Association, 535 North Dearborn Street, Chicago 10.

This film deals with a young girl's schizophrenic breakdown: its onset and development, the effect on her family and her friends, her hospitalization in a modern mental hospital, and her eventual discharge as recovered. Psychiatrists, psychologists, and others in allied professions can use the film to good advantage when they are called on to present mental health information to special interested groups. The film is also recommended for county and state medical meetings and for college students in medical, nursing, social work, and psychology departments.

The complete review of this film can be found in THE JOURNAL (**147**:1490 [Dec. 8] 1951) or in "Reviews of Medical Motion Pictures," 1951 supplement, page 54.

MEDICAL LITERATURE ABSTRACTS

UNITED STATES

A.M.A. Arch. Internal Medicine, Chicago

89:171-352 (Feb.) 1952

Walter Reed: "He Gave to Man Control of That Dreadful Scourge—Yellow Fever." W. B. Bean.—p. 171.

Studies of Fluid, Electrolyte, and Nitrogen Balance in Acute Renal Insufficiency. L. T. Iseri, T. M. Batchelor, A. J. Boyle and G. B. Myers.—p. 188.

Practical Control of Fluid and Electrolyte Balance in Carbon Tetrachloride Nephrosis: Report of Cases. R. C. Partenheimer and D. S. Citron.—p. 216.

Electrolyte Metabolism During Rice Diet: I. Serum Electrolytes in Hypertensive Patients Without Evidence of Advanced Renal Involvement. E. Peschel and R. Lohmann-Peschel.—p. 234.

*Terramycin Therapy of Urinary Tract Infections. C. R. Womack, G. G. Jackson, T. M. Gocke and others.—p. 240.

Explosive Outbreak of Atypical Pneumonia ("K-8 Fever"). P. Troen.—p. 258.

*Viremia in Acute Hemolytic Anemia and in Autohemagglutination: Report of Case and Review of Literature, with Special Reference to Virus of Newcastle Disease. S. E. Moolten and E. Clark.—p. 270.

*Hemolytic Anemia in Viral Pneumonia with High Cold-Agglutinin Titer. R. S. Aaron.—p. 293.

Conversion of Lymphocytic Leukemia to Hodgkin's Disease. M. Krim, L. M. Meyer, J. Rosenthal and N. D. Ritz.—p. 297.

Essential Lipemia, Acute Gout, Peripheral Neuritis, and Myocardial Disease in a Negro Man: Response to Corticotropin. J. K. Fulton.—p. 303.

Syphilis: Review of Recent Literature. H. Beerman, W. T. Ford, L. Nicholas and L. Katzenstein.—p. 309.

Terramycin Therapy of Urinary Tract Infections.—As part of a general clinical evaluation of terramycin, studies were made in 112 patients with acute and chronic infections of the urinary tract. Escherichia coli and Aerobacter aerogenes, most frequently present before treatment, were eliminated during terramycin therapy in most cases. Strains of Proteus vulgaris and staphylococci were less frequent in the pretreatment specimens of urine, but these organisms persisted in a greater proportion of cases and appeared more frequently for the first time during or shortly after terramycin therapy. The urine was rendered bacteria-free in about 37% of all the cases and in 20% of those in which more than one strain was originally present. In the remaining cases the original organism persisted and/or additional strains appeared in the urine and maintained the infection. Bacteremia rapidly subsided in most instances, but occasionally it developed during terramycin therapy. There was a fairly good correlation between the sensitivity of the strains to terramycin in vitro and the effects of treatment with this antibiotic. Most of the sensitive strains were readily eliminated, while one-half of the resistant strains isolated before treatment persisted, and most of the other resistant strains appeared during or soon after the terramycin therapy. Pyuria diminished or disappeared in about one-half of the cases, more frequently in acute cases. Fever and local symptoms were favorably influenced in more than one-half of the cases, but in some the improvement was only temporary. On the basis of both clinical and laboratory findings, about one-half of the patients were benefited by the terramycin therapy. There were 14 deaths, which occurred primarily in old persons and in some cases were probably unrelated to the urinary infection. The most important feature of the fatal cases was the frequent occurrence during terramycin therapy of pathogenic strains of hemolytic Staphylococcus pyogenes var. aureus; the infections for which they apparently were responsible included staphylococcal pneumonia, endocarditis with embolic phenomena, and staphylococcal dysentery. In some instances vomiting and/or diarrhea was severe enough to interfere with terramycin therapy, and this was a major factor in most of the fatal cases.

Viremia in Hemolytic Anemia and the Virus of Newcastle Disease.—A case of acute hemolytic anemia with autohemagglutinative vascular phenomena is reported in which the virus of Newcastle disease (avian pneumoencephalitis) was isolated from the patient's blood shortly after the acute phase of her illness had subsided. During the active stages of the illness the patient had an eruption resembling that of acute disseminated lupus erythematosus. Cortisone and corticotropin (ACTH) therapy produced temporary improvement, followed by relapse during their continued administration. The spontaneous infection with Newcastle virus in this patient, as in a recent epizootic in laboratory hamsters, is probably related to lowering of the natural resistance for a virus that may be widely prevalent in mammals but is ordinarily latent. Similarities between the acute hemolytic syndrome of this case and that of others reported in the literature suggest that hemotoxic viruses may be commoner than is suspected as a cause of acute hemolytic anemia. Certain data appear to indicate that acute hemolytic anemia and hemagglutinative syndromes complicating Hodgkin's disease, leukemia, lymphosarcoma, and other diseases of the reticuloendothelial system may result from the multiplication of latent viruses as a result of impaired antiviral resistance. Nutritional deficiencies may play a similar role. The presence of immune agglutinins for red blood cells, revealed by the Coombs' test, may be explained in some instances by antiviral substances attached to virus-sensitized red cells and not necessarily by the presence of a hemolytic autoantibody. On the other hand, the absence of a positive Coombs' antiglobulin reaction in acute hemolytic anemia (as in the case cited here) may be accompanied by a positive antialbumin reaction, suggesting that serum albumin has been absorbed as a result of viral injury or other hemotoxic agent. In such cases a false-positive Coombs' test may be obtained with Coombs' reagent prepared by immunizing rabbits with whole human serum. Examination of the blood for viruses may be warranted in various clinical conditions in which resistance to infection may be impaired, particularly when complicated by hemolytic or hemagglutinative phenomena demonstrable by laboratory methods or manifested as acquired hemolytic anemia or atypical vascular symptoms, such as Raynaud's syndrome or acrocyanosis. In tests in 17 other patients showing autohemagglutination in vitro, hemagglutinating viruses were recovered in 14.

Hemolytic Anemia in Viral Pneumonia and High Cold Agglutinin Titer.—The association of cold agglutinins and primary atypical pneumonia has been frequently noted. This paper describes the case of man, aged 46, in whom hemolytic anemia occurred in viral pneumonia associated with a high cold agglutinin titer. The cold agglutinin titer was positive in the dilution of 1:4,096 during the acute phase of the illness, and was the last laboratory finding to return to normal. The author believes that the positive serologic reactions for syphilis and an increased heterophile-agglutination titer were coincidental findings. He points out that in syphilitic cold hemoglobinuria, anemia usually does not occur, the cold agglutinins are not found in such high titer, and the Donath-Landsteiner test (hemolysis at 37 C after chilling, but not in the cold) always produces a positive reaction. In spite of the high heterophil agglutination and mild adenopathy, the absence of atypical lymphocytes and hepatosplenomegaly would tend to exclude infectious mononucleosis. Unfortunately, the agglutination was not performed at incubator temperature, nor was the more specific test with guinea pig kidney absorption used. The author feels that the cold agglutinin titer should be determined in all cases of unexplained hemolytic anemia.

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Titles marked with an asterisk (*) are abstracted.

ever, in themselves constitute the "sharply defined national or state policies" the frustration of which may, as a matter of law, preclude the deductibility of an expense under the income tax law.

"We voice no approval of the business ethics or public policy involved in the payments now before us," the court concluded.

Accordingly, the judgment of the court of appeals was reversed and the cause remanded to the tax court with directions to set aside its judgment insofar as it is inconsistent with this opinion. *Lilly v. Commissioner of Internal Revnue, 72 S. Ct. 497 (1951).*

Pharmacy Schools: Classification by Private Association.—The plaintiff filed a petition for a writ of mandamus to compel the respondent, Florida State Board of Pharmacy, to permit Abraham Newman to take the state pharmacy examination. From an order of the trial court granting the writ, the respondent appealed to the Supreme Court of Florida.

The evidence indicated that Newman was over the age of 21 years old and of good moral character and was licensed to practice pharmacy in both New York and Connecticut. He graduated from Fordham College of Pharmacy in 1930. At that time, Fordham was not a member of the American Association of Colleges of Pharmacy, but it became a member in 1939, and has remained a member ever since. The sole question presented for determination, said the court, is whether the petitioner has complied with the statute by showing that he is ". . . a graduate of an 'accredited school or college or pharmacy holding membership in the American Association of Colleges of Pharmacy and accredited by said board of pharmacy.' "

A construction of this language presents some difficulty, said the court. It is the duty of the court to, if possible, ascribe to the language used a meaning that will not cause the statute to be unconstitutional. The word "accredited" and the phrase "accredited by said board of pharmacy" cannot be held to vest in the Florida State Board of Pharmacy an unlimited and uncontrolled discretion in determining which schools will be accepted as "accredited" without rendering the act invalid. The statute provides no standard that a college must attain to be accredited by the board, unless such standard be found in the phrase "such school or college of pharmacy holding membership in the American Association of Colleges of Pharmacy."

Membership in a voluntary association, which may be denied at the whim of the association or declined at the pleasure of the school, the court continued, is in no sense a reasonable basis for determining the proficiency of the graduates of an institution. If the phrase be construed as ambulatory, the statute to that extent is unconstitutional. The respondents admit that the statute cannot be construed as ambulatory in prospect but urge that it be so construed as to relate to those institutions that were members of the association when the act became effective and were also members of the association at the time this particular applicant received his diploma. This would make the statute more logical, the court admitted, but there is nothing in the language used by the legislature that would justify the court in holding this statute ambulatory in retrospect and not ambulatory in prospect.

The only construction that this court can place on the statute as written, which does not offend the constitution, concluded the Supreme Court, is that the phrase "such school or college of pharmacy holding membership in the American Association of Colleges of Pharmacy" constitutes a definition of an "accredited" school and must be construed as being fixed as of the date of the enactment of this statute, so that, in reality the statute constitutes a legislative determination that those schools that were on the membership rolls of this association at that time are designated as "accredited" just as if each such school had been designated by name in this statute. Adopting this construction, said the court, the statute as applied to Newman could be paraphrased to require an applicant to be "a graduate of one of the following schools . . . Fordham College of Pharmacy. . . ." Since the petitioner is admittedly a graduate of Fordham, his right to take the examination is clear. Accordingly, the writ of mandamus, directing that Newman be admitted to the examination, was affirmed. *Attwood et al. v. State ex rel. Newman, 53 So. (2d) 825 (Florida, 1951).*

MEDICAL MOTION PICTURES

NEW FILMS ADDED TO A. M. A. LIBRARY

Functional Anatomy of the Hand: 16 mm., color, sound, showing time 28 minutes. Produced in 1951 by Duke University, Department of Anatomy, Durham, North Carolina. Procurable on loan (service charge $1.00) from Committee on Medical Motion Pictures, American Medical Association, 535 North Dearborn Street, Chicago 10, or National Foundation for Infantile Paralysis, 120 Broadway, New York 5.

The film graphically depicts normal function of the muscles of the hand and forearm as well as the relation of the muscles to the skeletal structure. To demonstrate function, the arm has been dissected so that wires could be attached to individual muscles and their operation shown either individually or in groups. To depict the relation of the muscles to the skeletal structure, each muscle as it is described by the narrator is positioned in its proper place on the skeleton. This film is remarkable for the extremely clever dissection, which enables the anatomist to work the individual tendons of the wrist and fingers, and for the adroit use of a mirror whereby the same movement is viewed from two aspects at once.

The photography is satisfactory; however, the overlay labels are very poor and somewhat distracting. The picture is long, and it may be advisable to show it in sections. A 16-page brochure is sent with each copy of the film, and it is important that the teacher read this booklet before the picture is used in classroom situations. It can be recommended for orthopedic surgeons, medical students, physical therapists, and occupational therapists.

The Quiet One: 16 mm., black and white, sound, showing time 66 minutes. Produced in 1948 by Film Documents, New York. Procurable on loan (service charge $8.00) from Committee on Medical Motion Pictures, American Medical Association, 535 North Dearborn Street, Chicago 10.

This film portrays the story of a 10-year-old boy who had the misfortune to be born into a family that resented his existence and left him to shift for himself. It vividly shows the hopeless struggle that builds up in the mind of a child continually denied the feeling of being wanted and how he eventually drifts into delinquency. The child is sent to a correction school for wayward boys staffed by experienced counselors under the direction of a psychiatrist. The job of emotional rehabilitation is what makes this film so fascinating to students of human behavior. The groups who might profit from this film are medical students or residents in pediatrics or psychiatry, persons connected with child care institutions as staff or volunteer workers, social workers and nurses preparing for public health work or pediatrics, and teachers working with retarded children.

The complete review of this film can be found in The Journal (145:110 [Jan. 13] 1951) or in "Reviews of Medical Motion Pictures," 1951 supplement, page 11.

Breakdown: 16 mm., black and white, sound, showing time 42 minutes. Produced in 1951 for the Mental Health Authorities of the Provinces of Canada by the National Film Board of Canada. Procurable on loan (service charge $3.00) from Committee on Medical Motion Pictures, American Medical Association, 535 North Dearborn Street, Chicago 10.

This film deals with a young girl's schizophrenic breakdown: its onset and development, the effect on her family and her friends, her hospitalization in a modern mental hospital, and her eventual discharge as recovered. Psychiatrists, psychologists, and others in allied professions can use the film to good advantage when they are called on to present mental health information to special interested groups. The film is also recommended for county and state medical meetings and for college students in medical, nursing, social work, and psychology departments.

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mild local allergic reactions after one week of daily therapy. The symptoms were reversed in 120 (94%) of the 127 patients, with excellent results in 56 (44%), good results in 50 (40%), and fair results in 14 (10%). Seven patients (6%) were therapeutic failures. In patients who had good to excellent results clinical remission occurred within a week of institution of treatment. While improvement in vibratory sense could be detected quantitatively, this reversibility first became evident two to four weeks after treatment was started. Disturbances in tendon reflexes and the muscle atrophy seemed to be irreversible. A two week course of treatment usually produced a remission for two to six months. Resumption of treatment during the relapse generally effected a prompt remission comparable with the initial remission. When there was a tendency for relapses to occur, administration of the extract once a week maintained the patient in continuous remission. Remissions have been observed for as long as two years. The therapeutic effects were probably derived from components not previously isolated from the liver. Analysis of the extract revealed the presence of only 0.09 μg of vitamin B_{12} and 0.15 μg of folic acid per milliliter, quantities that have no therapeutic role in the neuropathies.

Further Experiences with Liver Extract for Diabetic Neuropathies.—Of 20 diabetic patients with neuropathies treated with an extract of liver from pregnant mammals, 2 women had diabetic cord bladder, 1 had ulnar nerve palsy due to pressure, 1 advanced generalized vascular disease with a nonhealing ulcer of the leg and a previous history of severe diarrhea with nocturnal incontinence of feces, 1 partial foot-drop, and the remaining 15 had typical diabetic neuritis, with severe pain in one or more extremities. Treatment as a rule consisted of daily intramuscular injections of 5 cc. of the extract, and in a few cases the dose was 10 cc. Gratifying results were obtained in patients with hyperglycemic, achlorhydric, neuritic, vascular, and degenerative symptoms. Only 2 of the 20 patients did not obtain complete relief of symptoms, but both had associated psychic disturbances that made evaluation of results difficult. Rapid recoveries, even in patients with marked vascular and degenerative disturbances, were striking. Complete relief from pain and other manifestations were obtained despite the persistent hyperglycemia and glycosuria, which were permitted in order to exclude control of the diabetes mellitus as a variable in interpretation of these results. Complete relief of pain in a case complicated by widespread osteoarthritis was noted. There was no evidence that the liver extract had any effect on diabetes mellitus itself. Sixteen additional patients with diabetic neuritis of the extremities had been treated with the extract, and of the total of 36 patients subjected to this treatment, only three were therapeutic failures. An extensive trial is indicated in the early stages of diabetic retinopathy and in cases of sexual impotence associated with diabetes mellitus.

Am. Practitioner & Digest of Treatment, Philadelphia

3:1-88 (Jan.) 1952

Holistic Attitude in Medical Consultation. R. J. Weil and H. R. Landmann.—p. 1.
Angiocardiography in Definitive Diagnosis of Cardiovascular Disease. H. J. Jacobs.—p. 6.
Value of Protein in Surgery—Special Emphasis on Oral Feedings. E. R. Crews.—p. 13.
Sarcoidosis. H. L. Israel and M. Sones.—p. 18.
Methylparafynol—New Type Hypnotic: Preliminary Report on Its Therapeutic Efficacy and Toxicity. H. L. Hirsh and W. H. Orsinger.—p. 23.
*Symptomatic Relief of Osteo-Arthritis and Osteoporosis with Vitamin B_{12}: Preliminary Report. J. D. Hallahan.—p. 27.
Etiology, Pathologic Physiology and Diagnosis of Acute Pancreatitis. S. Y. Garrett.—p. 33.
Subluxation of Head of Radius. A. J. Kanter and O. C. Bruton.—p. 39.
Thrombopenic Purpura Following Quinine Medication. R. B. Lincoln and H. L. Schmidt.—p. 43.

Vitamin B_{12} in Osteoarthritis and Osteoporosis.—Since vitamin B_{12} is a potent bone marrow stimulant, Hallahan decided to try it in osteoporosis. Patients with osteoarthritis were to serve as controls, but when they showed great relief, it was decided to report this, and to further study the response of these patients to vitamin B_{12}. Crystalline vitamin B_{12} was given by injection in doses of from 30 to 100 μg at weekly intervals to 33 patients with osteoarthritis, the majority receiving 100 μg. By the end of the third week, all but 2 showed improvement, which was complete in 12; the others showed complete relief in some joints and partial relief in other joints. Only two patients with advanced osteoporosis were treated with vitamin B_{12}. In one of them the initial dose was 900 μg, and when she obtained prompt relief this dose was continued at weekly intervals for three weeks. As a result she became completely free of knee and back pain, but after the treatment had been discontinued for two weeks, the knee pain recurred. She was then given 30 μg per week and the symptoms again subsided, but recurred once more after the treatment had been interrupted for a month. This time 90 μg per week was given for one month, with her symptoms clearing more promptly than when 30 μg had been used. She was given several more courses of 90 μg per week. The other patient with osteoporosis was given injections of 90 μg weekly for three weeks and has remained free from discomfort for two months so far. Why vitamin B_{12} is effective in relieving symptoms of osteoarthritis and osteoporosis is not known. No benefit was noted in three cases of rheumatoid arthritis and one case of metastatic malignancy to bone. Benefit was achieved in one case of spondylolisthesis and in the polyneuritis of diabetes mellitus. No toxic effects were noted, although one case of gouty arthritis was possibly aggravated by a trial of vitamin B_{12}.

Gastroenterology, Baltimore

20:1-202 (Jan.) 1952

*Choice of Therapeutic Measures in Management of Chronic Relapsing Pancreatitis and Pancreatolithiasis. R. B. Cattell and K. W. Warren. —p. 1.
Time of Healing of Gastric Ulcers: Implications as to Therapy. F. Steigmann and B. Shulman.—p. 20.
Unfavorable Course of Gastric Ulcer During Administration of ACTH and Cortisone. J. B. Kirsner, A. P. Klotz and W. L. Palmer.—p. 27.
Results of Medical Treatment of Idiopathic Cardiospasm. A. C. Crump, C. A. Flood and G. C. Hennig.—p. 30.
Urine Coproporphyrin Excretion in Viral Hepatitis. D. A. Sutherland and M. Bollier.—p. 39.
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Polycystic Disease of Liver: Study of 24 Cases. M. W. Comfort, H. K. Gray, D. C. Dahlin and F. B. Whitesell Jr.—p. 60.
Clinical Studies of Blood Lipid Metabolism: II. Blood Serum Variations of Cholesterol, Phospholipids, Neutral Fats, Total Lipids, and Blood Lipid Fraction Percentages in Peptic Ulcer Patients. A. A. Goldbloom.—p. 79.
Roentgen Diagnosis of Prolapse of Gastric Mucosa into Duodenum. M. Feldman and P. Myers.—p. 90.
*Prolapse of Gastric Mucosa Through Pylorus: Physiological or Abnormal? E. D. Bartels and H. Eltorm.—p. 100.
Complications of Gastrointestinal Diverticula Demonstrated by X-Ray. E. A. Mandelsohn.—p. 105.
Gastrointestinal Symptoms of Genito-Urinary Origin. D. R. Smith. —p. 119.
Study of Choledochal Spincter Action. J. L. Smith, R. L. Walters and J. M. Beal.—p. 129.
*Gastric Secretory Response to 3-Beta Aminoethyl Pyrazole in Man. J. B. Kirsner, E. Levin, W. L. Palmer and H. Ford.—p. 138.
Comparison of Plain Methylcellulose with Compound Bulk Laxative Tablet. D. A. Berberian, R. J. Pauly and M. L. Tainter.—p. 143.
Clinical Evaluation of Certain Bulk and Irritant Laxatives. L. J. Cass and L. P. Wolf.—p. 149.

Therapy of Relapsing Pancreatitis.—Chronic relapsing pancreatitis and pancreatolithiasis are characterized by recurrent attacks of epigastric pain. As the disorder progresses, varying degrees of pancreatic failure occur and give rise in turn to various gastrointestinal symptoms, malnutrition, jaundice, and occasionally diabetes mellitus. Cattell and Warren point out that despite medical treatment, surgical measures will be required in the majority of cases. The 29 patients here reviewed underwent a total of 91 operations. Twenty-one patients had had one or more abdominal operations related to the pancreatitis (a total of 43 operations) before coming to the Lahey Clinic. After listing and discussing the 48 operations performed at the Lahey Clinic on the 29 patients, the authors feel that their conclusions are still only tentative. Thoracolumbar sympathectomy, either unilateral or bilateral, is occasionally employed as a primary procedure, when the inflammatory reaction is so intense that resection is unduly hazardous, but since the good results of sympathectomy are usually temporary, this operation is done less often. Distal pancreatectomy is effective when the pathological process is confined to the distal segment of the pancreas, but it should not be employed in diffuse pancreatitis. Pancreatoduodenectomy permits removal of the common point of obstruction at the periampullary area of the duct of Wirsung, and allows removal of a major portion of the involved gland. Residual stones can be removed from the duct in the pancreatic remnant, and the duct can then be implanted into the jejunum. Although this procedure has not been effective in every case, it has given the best results. However, one should bear in mind that pancreatoduodenectomy is a difficult procedure and that alternative surgical methods are available. Occasionally, the best results are obtained with a combination of surgical procedures. The most promising combination is partial pancreatectomy, either proximal or distal, with contralateral thoracolumbar sympathectomy. Distal pancreatectomy will have a more limited applicability than pancreatoduodenectomy and therefore the combined procedure will usually consist of pancreatoduodenectomy, followed by left thoracolumbar sympathectomy if adequate relief is not obtained by resection.

Prolapse of Gastric Mucosa.—According to some authors prolapse of the gastric mucosa through the pylorus produces symptoms of dyspepsia, whereas others regard it as only a physiological variation. Reviewing the literature on this condition, Bartels and Eltorm found that the condition has no characteristic symptomatology and so they decided to study the roentgenograms of the stomachs of 240 patients admitted for treatment of dyspepsia. They found 44 (or 18.3%) who had gastric prolapse, and in 34 the prolapse was rather extensive. Then they studied 42 persons without dyspeptic complaints. This group included 10 with a typical large prolapse and 11 with small folds. In other words, the frequency of mucosal prolapse through the pylorus was higher among the control than among the dyspeptic group. The explanation is that a large number of the dyspeptic patients had deformities of the duodenal bulb because of ulcer or cancer, and in such cases a prolapse cannot be discerned. On the basis of these observations the authors believe prolapse of the gastric mucosa through the pylorus is a normal physiological variation.

Gastric Response to 3-β Aminoethyl Pyrazole.—Kirsner and associates studied the secretory response of the stomach to an analogue of histamine, 3-β aminoethyl pyrazole, in 50 persons: 22 without organic disease, 24 with peptic ulcer, and 4 with miscellaneous lesions. The secretory response to the analogue approximated that elicited by histamine. It is injected intramuscularly in 50 mg. doses. The decreased tendency to side-effects was striking, and all patients emphatically preferred the new material. The analogue thus appears to be a potent and nontoxic substitute for histamine for the study of gastric secretion in man.

Indiana State Medical Assn. Journal, Indianapolis

45:1-84 (Jan.) 1952

Blood-Containing Urachal Cyst Simultating Acute Appendicitis: Report of Case. G. C. Rasch.—p. 17.
Toward Optimal Nutrition. P. Kurtz.—p. 19.
Quinidine Treatment of Ventricular Tachycardia Following Acute Coronary Occlusion: Case Report. R. U. Leser and R. H. Opfell.—p. 23.
Breast Feeding. R. B. DuBois.—p. 28.
Flashlight in Rectum. M. O. Scamahorn.—p. 31.

45:85-176 (Feb.) 1952

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Problems of Parenteral Nutrition in the Surgical Patient. C. O. Rice and J. H. Strickler.—p. 122.

Iowa State Medical Society Journal, Des Moines

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Spontaneous Hypoglycemia: Use of Provocative Insulin Test. R. P. Hardwig and C. E. Schrock.—p. 6.
Osteoporosis and Diabetes Mellitus: Report of Case. P. W. Berney. —p. 10.
Changing Trends in Surgery of Colon. G. Crile Jr. and R. B. Turnbull Jr. —p. 12.
Importance of Life Planning. V. F. Nellis.—p. 16.

Journal of Applied Physiology, Washington, D. C.

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Analysis of Factors Affecting Concentrations of Oxygen and Carbon Dioxide in Gas and Blood of Lungs: Results. K. W. Donald, A. Renzetti, R. L. Riley and A. Cournand.—p. 497.
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Alveolar CO_2 During Respiratory Cycle. A. B. DuBois, A. G. Britt and W. O. Fenn.—p. 535.
Temperature of Human Bone Marrow. N. L. Petrakis.—p. 549.
Rate of Pulmonary Nitrogen Accumulation as Index of Lung to Blood Transfer of Gases. H. Specht and H. F. Brubach.—p. 554.
Factorial Experiment to Test Effect of Various Types of Diets on Uric Acid Excretion of Normal Human Subjects. D. Wilson, C. Bishop and J. H. Talbott.—p. 560.
Effect of Analeptic Drugs on Somnifacient Effect of Seconal and Antihistaminics as Measured by *Flicker* Fusion Threshold. G. S. Roback, L. R. Krasno and A. C. Ivy.—p. 566.
Body Composition of Cattle: II. Determination of Fat and Water Content from Measurement of Body Specific Gravity. H. F. Kraybill, H. L. Bitter and O. G. Hankins.—p. 575.
Effect of Artificially Induced Hyperthermia on Electrocardiogram of Dog. H.. M. Geller, L. H. Nahum, R. S. Sikand and H. Levine. —p. 584.
Effects of Hypoxia on Renal Tubular Function. D. R. Axelrod and R. F. Pitts.—p. 593.
Renal Excretion of Sodium and Water in Man as Affected by Prehydration, Saline Infusion, *Pitressin and Thiomerin.* M. Ladd.—p. 602.

Journal of Aviation Medicine, St. Paul

22:439-558 (Dec.) 1951

Visual and Orthopedic Defects in Civil Airmen. D. M. Gilford and W. R. Stovall.—p. 442.
Noise Problems Associated with Aircraft Maintenance. H. O. Parrack and D. H. Eldredge.—p. 470.
*Acoustic Trauma in Aircraft Maintenance Workers. E. Guild.—p. 477.
Auditory Perception in Noise. J. Tonndorf.—p. 491.
Safe Human Tolerance for High Concentrations of CO Over Short Periods of Time. A. L. Hall, C. A. Patterson and J. K. Colehour. —p. 501.
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Aviation Medicine in Evaluation of New Naval Aircraft. R. A. Bosee and P. W. Gard.—p. 518.
Lethality of Simulated Altitude for Rabbits, Normal and Pretreated with Tetraethyl Pyrophosphate of Dibenamine. R. O. Bauer and J. Gourzis. —p. 524.
Personality Research in Naval Aviation Selection. J. F. Snyder.—p. 530.
*Further Studies on Effectiveness of Various Drugs Against Airsickness. H. I. Chinn, O. H. Waltrip and H. W. Massengale.—p. 535.

Acoustic Trauma in Aircraft Maintenance Workers.—Little attention has been given to the hearing acuity of men who do maintenance work on aircraft, although during power checks noise intensities exceed 130 db. on many reciprocating engine aircraft and 140 db. on jet-powered aircraft. Pure tone audiograms and histories of noise exposures and subjective reactions to noise were recorded on 354 aircraft maintenance workers. One-half (177) of the men worked on conventional and one-half on jet planes. The records were compared to those of 368 men who worked in relatively quiet environments and those of 139 experienced pilots. It was found that although many aircraft maintenance men retain normal auditory acuity despite years of exposure to intense noise, the average person has some loss greater than that expected without exposure to noise. In mechanics who suffer significant impairments the severity tends to be greater and the age of onset earlier than among men who have similar losses without exposure to excessive noise. Potentially, at least, jet engine noise influences auditory acuity more than the noise of reciprocating engines. Jet engine noise is so irritating that it affects the efficiency of some men. Many of the hearing impairments were not handicapping nor did they necessarily reflect permanent damage; however, they do show that among aircraft maintenance men, as among pilots and test cell workers, acoustic trauma is a problem.

Drugs Against Airsickness.—The effectiveness of scopolamine hydrobromide and of diphenhydramine (benadryl®) in preventing motion sickness has been well documented. It has also been reported that a *mixture* of these two drugs provides excellent protection with smaller amounts of each one. Recently, significant protection against motion sickness has been obtained with other drugs. Scopolamine aminoxide (scopodex) hydrobromide tested by the simulated turbulence technique was found to be superior to dimenhydrinate (dramamine®); trihexyphenidyl (artane®), an antispasmodic used in Parkinson's disease, chlorcyclizine hydrochloride (perazil®), and 10-(α-methyl-β-dimethylaminoethyl)-phenothiazin hydrochloride ("lergigan"), both long-acting antihistaminics, have given significant protection against seasickness. It was decided to compare these preparations with the scopolamine-diphenhydramine mixture. The efficacy of the drugs was tested during regular navigation training flights. In a comparison in over 3,000 subjects, this mixture consistently gave protection against airsickness equal to or greater than any other preparation tested. The side-effects of this preparation were minimal, consisting mainly of a slight increase in blurred vision and dry mouth. The mixture was superior to 2 mg. of scopolamine aminoxide and to 50 mg. of chlorcyclizine hydrochloride. It showed somewhat better protection against nausea and vomiting than did the scopolamine aminoxide-diphenhydramine combination, although this was not statistically significant. There was no difference in the effectiveness of "lergigan" and of the scopolamine-diphenhydramine mixture. Further comparison of these two preparations would be desirable, since the duration of action of "lergigan" has been reported to be long, which would enhance its value in long flights.

Journal of Clinical Investigation, Cincinnati

30:1307-1440 (Dec. [Part I]) 1951

Pathogenesis of Acute Renal Failure Associated with Traumatic and Toxic Injury: Renal Ischemia, Nephrotoxic Damage and Ischemuric Episode. J. Oliver, M. MacDowell and A. Tracy.—p. 1307.

30:1441-1580 (Dec. [Part II]) 1951

Venous Congestion of Extremities in Relation to Blood Volume Determinations and to Mixing Curves of Carbon Monoxide and T-1824 in Normal Human Subjects. E. Brown, J. Hopper Jr., J. J. Sampson and C. Mudrick.—p. 1441.
*Quantitative Antibody Studies in Man. I. Effect of Adrenal Insufficiency and of Cortisone on Level of Circulating Antibodies. D. L. Larson and L. J. Tomlinson.—p. 1451.
Renal Response to Intravenous Injection of Sodium Chloride Solutions in Man. B. Crawford and H. Ludemann.—p. 1456.
Velocity of Distribution of Sucrose Between Plasma and Interstitial Fluid, with Reference to Use of Sucrose for Measurement of Extracellular Fluids in Man. N. Deane, G. E. Schreiner and J. S. Robertson.—p. 1463.
Intracellular Water in Man. N. Deane.—p. 1469.
Total Red Cell Volume, Plasma Volume, and Sodium Space in Congestive Heart Failure. T. C. Prentice, N. I. Berlin, G. M. Hyde and others.—p. 1471.
Studies in Fat Metabolism. G. D. Michaels, S. Margen, G. Liebert and L. W. Kinsell.—p. 1483.
Effects of Adrenaline upon Renal Function and Electrolyte Excretion. W. E. Jacobson, J. F. Hammarsten and B. I. Heller.—p. 1503.
Quantitative Relationship Between Water Content of Skin and Inflammation Produced by Chemical Irritants. H. V. Weiss, V. E. Siler and P. R. Buechler.—p. 1507.
Ferrokinetics in Normal Persons and in Patients Having Various Erythropoietic Disorders. R. L. Huff, P. J. Elmlinger, J. F. Garcia and others.—p. 1512.
Effect of Adrenocorticotrophic Hormone (ACTH) on Cerebral Blood Flow and Metabolism. J. F. Schieve, P. Scheinberg and W. P. Wilson.—p. 1527.
Treatment of Nephrosis with Pituitary Adrenocorticotrophin. J. A. Luetscher Jr., Q. B. Deming and B. B. Johnson.—p. 1530.
Hemagglutinins and Hemolysins for Erythrocytes Sensitized with Tuberculin in Pulmonary Tuberculosis. W. H. Hall and R. E. Manion.—p. 1542.

Effect of Adrenal Insufficiency and Cortisone on Circulating Antibodies.—This paper presents observations on the effect of adrenal insufficiency and of cortisone on antibody titers in man. The patients serving as controls had peptic ulcer or arteriosclerotic heart disease. Desoxycorticosterone acetate was given to four of the five patients with adrenal insufficiency, who had the typical symptoms of Addison's disease. The cortisone-treated group were patients with rheumatoid arthritis receiving 200 mg. of the drug by mouth three times each week. Cortisone treatment was started at least two weeks before immunization and was continued throughout the test period. The method of Heidelberger and MacPherson was used for quantitative determination of precipitable antibody nitrogen. Type-specific capsular polysaccharides of pneumococcus types 1 and 2 were used as antigens. Since complement and C-antibody may add nitrogen to specific precipitates, these were removed before the analysis of the specific precipitates was carried out. The authors say that C-antibody was present in the serum of the 12 controls. The C-antibody remained relatively constant in spite of sizeable changes in antibody to the capsular polysaccharides. The antibody response of individuals varied considerably. A marked response to one antigen is not necessarily accompanied by a similar response to another antigen in the same person. Maximum antibody titers are usually achieved two weeks following immunization. The five patients with adrenal insufficiency did not demonstrate any impairment of antibody formation. The eight patients with untreated rheumatoid arthritis and nine patients with cortisone-treated rheumatoid arthritis had similar antibody responses when observed for four weeks. Two patients with rheumatoid arthritis with previously elevated antibody titers showed no change in these titers on administration of cortisone.

Journal of Experimental Medicine, New York

95:1-118 (Jan.) 1952

Growth Curve of Lansing Strain of Poliomyelitis Virus in Central Nervous System of Mouse. J. D. Ainslie.—p. 1.
Growth Curve of Lansing Strain of Poliomyelitis Virus in Mice: Effect of Sodium Monofluoroacetate and Methionine Sulfoximine on Early Phase of Growth of Virus. J. D. Ainslie.—p. 9.
Observations Concerning Production and Excretion of Cholesterol in Mammals: V. Relation of Biliary Retention of Cholesterol, Distention of Biliary Tract, Shunting of Bile to Vena Cava, and Removal of Gastro-Intestinal Tract to Hypercholesteremia Consequent on Biliary Obstruction. S. O. Byers and M. Friedman.—p. 19.
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Studies on Opsonins in Q Fever. J. Victor, R. Raymond, J. Valliant and others.—p. 61.
Mucoprotein Derived from Human Urine Which Reacts with Influenza, Mumps, and Newcastle Disease Viruses. I. Tamm and F. L. Horsfall Jr.—p. 71.
Electrophoretic Examination of Urinary Mucoprotein Which Reacts with Various Viruses. G. E. Perlmann, I. Tamm and F. L. Horsfall Jr.—p. 99.
Group A Streptococcus Polysaccharide: Studies on Its Preparation, Chemical Composition, and Cellular Localization After Intravenous Injection into Mice. W. C. Schmidt.—p. 105.

Journal of Immunology, Baltimore

68:1-114 (Jan.) 1952

Inhibition of Growth of Viruses in Chick Embryo by Aromatic Diamidines. M. D. Eaton, C. G. Levenson and M. Perry.—p. 1.
Protease Activation in Immune Reactions. W. B. Geiger.—p. 11.
Immunochemical Studies on Blood Groups: XII. Preparation of Blood Group Substances from Bovine Stomach Linings and Comparison of Their Chemical and Immunochemical Properties with Those of Blood Group Substances from Other Species. S. M. Beiser and E. A. Kabat.—p. 19.
Studies on Conglutinin: I. Its Role in Erythrocytic Agglutination in Relation to Application of Lattice Theory. J. A. Flick and A. L. Villafane.—p. 41.
Paradoxical Effect of Congo Red on Toxicity of Streptolysin S for Mice. K. Rosendal and A. W. Bernheimer.—p. 53.
Effect of Human Serum upon Agglutination of Enzyme-Treated Erythrocytes. R. E. Hoyt and H. Zwicker.—p. 61.
Hemagglutination by Tularemia Antisera: Further Observations on Agglutination of Polysaccharide-Treated Erythrocytes and Its Inhibition by Polysaccharide. G. G. Wright and R. J. Feinberg.—p. 65.
Fate in Rabbits of Intravenously Injected I^{131}-Iodoovalbumin. F. Haurowitz and C. F. Crampton.—p. 73.
Susceptibility of Irradiated Mice to Infection as Function of Post-Irradiation Time. I. L. Shechmeister, V. P. Bond and M. N. Swift.—p. 87.
Effect of Trypsin on Hemagglutination by Murine Encephalomyelitis Virus (GDVII). M. C. Morris.—p. 97.
Immunization of Laboratory Workers with Purified Trivalent Equine Encephalomyelitis Vaccine. F. D. Maurer, K. L. Kuttler, R. H. Yager and A. Warner.—p. 109.

Journal of Nervous and Mental Disease, New York

115:1-94 (Jan.) 1952

Disintegration of Central Autonomic Regulation During Fatigue and Its Reintegration by Psychosensory Controlling Mechanisms: I. Disintegration. Pupillographic Studies. O. Lowenstein and I. E. Lowenfeld.—p. 1.
Pragmatic Approach to Control of "Chronic Alcoholism." C. J. Katz.—p. 22.
Studies in Hypertension: I. Technics and Control Data. Central and Autonomic Nervous System Reactions of Normal Adults to Sensory and Ideational (Frustration) Stimulation. H. Jost, C. J. Ruilmann, T. S. Hill and M. J. Gulo.—p. 35.
Duration of Convulsions in Rats as Functions of Intensity, Duration and Cumulative Effects of Electroshock Stimulation. J. C. Townsend, R. W. Russell and R. A. Patton.—p. 49.
Observations on Use of Antihistaminics in Parkinson's Disease (Paralysis Agitans). S. G. Cohen and L. H. Criep.—p. 57.
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Obscuration Phenomenon—Form of Neural [illegible]aint. G. [illegible]—p. 72.

J. Neuropathology & Exper. Neurology, Baltimore

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Two Types of Wilson's Disease; Hepato-Lenticular Degeneration: Case Reports. H. Pierson.—p. 19.
Hemorrhagic Cerebral Infarction by Arterial Occlusion: Experimental Study. R. F. Hain, R. V. Westhaysen and R. L. Swank.—p. 34.
Silver Studies of Degenerating Thalamo-Cortical Connections. A. Vaz Ferreira.—p. 44.
Diffusion and Absorption Within the Brain: Experimental Study with Prussian Blue and India Ink in Rabbits and Cats. C. Bertrand.—p. 53.
Multilocular Encephalomalacia: Case Report. J. Negrin Jr., H. Lepow and B. Miller.—p. 62.
Experimental Study of Post Mortem Alterations in Neurons of Central Nervous System. R. S. Koenig and H. Koenig.—p. 69.
Dissimilar Lesions of Nervous System: Brain Tumor and Syringomyelia. W. W. Kaelber.—p. 79.

J. Pharmacology & Exper. Therap., Baltimore

104:1-114 (Jan.) 1952. **Partial Index**

Renal Action of Mercurial Diuretics as Affected by Sodium Load. A. Farah, T. S. Cobbey Jr. and W. Mook.—p. 31.
Chronic Tolerance Studies on β-Diethylaminoethyl Xanthene-9-C-Carboxylate Methobromide (Banthine). H. B. Freese, W. E. Hambourger, L. D. Calvin and D. M. Green.—p. 54.
Respiratory Effects of Potent Hypotensive Derivatives of Veratrum. L. Mosey and A. Kaplan.—p. 67.
Emetic Properties of Veratrum Derivatives. E. D. Swiss.—p. 76.
Prolongation of Anticoagulant Action of Heparin with Procaine and Butacaine Conjugates. T. A. Loomis, J. E. Jesseph and R. E. Beyer.—p. 87.

Journal of Urology, Baltimore

67:1-128 (Jan.) 1952

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Certain Concepts in Human Male Fertility. J. MacLeod.—p. 19.
Kidney and Hypertension. G. E. Wakerlin.—p. 27.
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Peripelvic Lipoma. S. Immergut and Z. R. Cottler.—p. 50.
Squamous Cell Carcinoma of Renal Pelvis. V. H. Youngblood and J. E. Kicklighter.—p. 54.
Biopsy of Kidney for Suspected Neoplasm. H. M. Weyrauch, H. L. Wanless, J. L. Goebel and K. G. Scott.—p. 60.
Bilateral Renal Agenesia. H. Levin.—p. 86.
Metastatic Melano-Epithelioma of Urinary Bladder: Report of Case. R. P. Morrow Jr., L. B. Woolner and J. L. Emmett.—p. 92.
Suprapubic Transvesical Prostatectomy with Primary Closure of Bladder Using Oxidized Cellulose: Analysis of 100 Cases. R. C. Thumann Jr. and G. D. Stump.—p. 95.
Evaluation of Oxycel-Bag Catheter Technique in Suprapubic Prostatectomy. W. J. Baker and E. C. Graf.—p. 101.
*Retropubic Prostatectomy and Inguinal Hernia Repair. L. W. Riba and W. H. Mehn.—p. 106.
Osteitis Pubis Following Retropubic Prostatectomy. C. K. Pearlman.—p. 117.
*Mortality of Various Methods of Prostatectomy. J. E. Byrne.—p. 121.
Ovarian Cyst and Uremia. J. W. Cherry.—p. 126.

Retropubic Prostatectomy and Hernia Repair.—Riba and Mehn performed retropubic prostatectomies on 14 patients during the past 18 months. Eleven of the operations were done for adenomatous hyperplasia and three for carcinoma of the prostate. The authors were favorably impressed with the retropubic operation. It provides good access except in a very deep pelvis, when a suprapubic enucleation may be preferable. The bladder and peritoneum are undisturbed and this results in less trauma, shock, and hemorrhage. Extra and intracapsular hemorrhage can be controlled, and adenomatous tags removed under direct vision. The authors found that the transverse abdominal incision is of value in retropubic procedures and is especially useful in obese patients. They also found that a satisfactory repair of inguinal hernias may be done in conjunction with a retropubic prostatectomy. The method used is similar to the McVay procedure, in that the superior pubic (Cooper's) ligament is utilized.

Mortality of Various Methods of Prostatectomy.—In this study 347 prostatectomies performed by six surgeons at one hospital during a 10 year period are reviewed. Conventional methods were used: transurethral electrocautery resection in 202 cases; the one stage suprapubic operation in 62 cases; the two stage suprapubic operation in 81 cases; and perineal prostatectomy in two cases. Transurethral prostatectomy was the method of choice in the majority of cases, regardless of the age of the patient. The mortality rate and hospital stay were less with transurethral resection than with any other method. A sufficient number of suprapubic prostatectomies are still being done to indicate that it is the procedure of choice in selected cases. A comparison of mortality figures before and after the introduction of antibiotics shows a lower mortality for the one stage suprapubic operation, but the antibiotics have not influenced the mortality of the two stage suprapubic operation. There has been little or no change in the length of hospitalization for patients undergoing suprapubic prostatectomies.

Maryland State Medical Journal, Baltimore

1:1-48 (Jan.) 1952

Activities of the Medical and Chirurgical Faculty. W. D. Wise.—p. 3.
The Maryland Advisory Committee to Selective Service—A Report. R. W. Graham Jr.—p. 8.
Maryland Civil Defense Medical Services. R. H. Riley and H. G. Fritz.—p. 10.

MEDICOLEGAL SYMPOSIUM—DRUG ADDICTION

Pharmacology of Drugs Causing Addiction. E. H. Dearborn.—p. 21.
Prosecution of Drug Cases. A. Sodaro.—p. 25.

Mental Hygiene, Albany, N. Y.

36:1-176 (Jan.) 1952. **Partial Index**

Experiment in Promoting Human Relations in Supervision. P. Schafer and S. S. Norvick.—p. 6.
When Doctors Disagree. J. C. Whitehorn.—p. 25.
Psychodrama in a State Hospital. M. M. Parrish and J. Mitchell.—p. 33.
Psychiatric Case Studies with Teachers. M. Kanzer.—p. 44.
Interracial Practices in Mental Hospitals. R. B. Stevens.—p. 56.
Mental Health of the Three Little Monkeys. W. W. Argow.—p. 121.

Michigan State Medical Society Journal, Lansing

51:1-144 (Jan.) 1952

Our Responsibility and Opportunity. J. W. Cline.—p. 33.
Doctors and Federal Medical System: Problem, Findings and Solution. R. C. Page.—p. 41.
Subtotal Gastrectomy with Postoperative Complications: Case Report. H. C. Saltzstein and S. R. Scheinberg.—p. 49.
Painful States of Shoulder and Arm: Diagnosis and Treatment. R. C. Bassett and S. J. O'Connor.—p. 55.
Principles and Problems in Psychotherapy with Veterans. T. V. Hoagland.—p. 62.
Know How to Live. W. T. Reeves Jr.—p. 65.

New England Journal of Medicine, Boston

246:41-76 (Jan. 10) 1952

New Concept of Etiology of Megaloureters. O. Swenson, H. E. MacMahon, W. E. Jaques and J. S. Campbell.—p. 41.
Deaths from Poisoning: Massachusetts, 1938-1948. M. Moore, L. Alexander and J. Ipsen Jr.—p. 46.
*Aureomycin in Treatment of Diffuse Peritonitis. A. M. Rutenburg, S. W. Jacob, F. B. Schweinburg and J. Fine.—p. 52.
The Tuberculous Diabetic Patient. M. A. Ferrara.—p. 55.
Use of ACTH and Cortisone in Dermatology. J. G. Downing.—p. 56.

Aureomycin in Diffuse Peritonitis.—This paper reviews the therapeutic response to aureomycin of 59 patients with diffuse peritonitis of intestinal origin. Aureomycin hydrochloride buffered with sodium glycinate was administered intravenously during the acute phase of the disease. The usual dosage was 500 mg. of the drug dissolved in 500 cc. of isotonic sodium chloride or dextrose solution twice daily. Patients with fulminating infections received 500 mg. of aureomycin every six to eigth hours. After the peritonitis had been brought under control, the antibiotic was given orally. The response was excellent in 47 patients, doubtful in 6, and poor in 1. Five other patients died, although in two the infection had been controlled. In most cases the convalescence was rapid and wound healing as fast as if no infection had been present. The results indicate that aureomycin alone is more effective than penicillin alone and at least as effective as aureomycin and penicillin combined. Eight patients responded to aureomycin after penicillin had failed to control the infection; two others recovered only when aureomycin was added to initial penicillin therapy. Those patients who failed to respond satisfactorily to aureomycin alone did not improve after combined antibiotic therapy or massive penicillin therapy alone. Aureomycin produced signs of gastrointestinal toxicity in the form of stomatitis, esophagitis, and diarrhea in one-fifth of the patients, but no other toxic effects were noted. The authors feel that aureomycin is superior to penicillin in the treatment of peritonitis.

New York State Journal of Medicine, New York

52:113-256 (Jan. 15) 1952

Uremia: Some Clinical Aspects and Medical Treatment. M. E. Holmes. —p. 175.
Relationship Between Certain Types of Renal Damage and pH of Urine. J. U. Schlegel.—p. 180.
Diagnosis and Treatment in Traumatic Injuries of Bladder and Urethra. R. B. Laury.—p. 187.
Peristalsis of Upper Urinary Tract as Demonstrated by New X-Ray Technic: Preliminary Report. T. H. Johnson.—p. 189.
Lymphomatous Involvement of Genitourinary Tract. H. L. Boyd.—p. 197.
Management of Kidney Injuries. F. O. Harbach, L. E. Gibson and C. H. Lynch.—p. 205.
Urologic Problems in Uremic Patient: Their Investigation and Management. J. H. Harrison.—p. 209.
Retropubic Prostatectomy: Survey of Indications and Results of 119 Cases. G. E. Slotkin.—p. 220.
2-Amino-1-(*p*-Methylphenyl)-Propane (Aptrol) as Anorexigenic Agent in Weight Reduction. E. P. Gelvin and T. H. McGavack.—p. 223.
Effectiveness of Hydroxy-Phenyl Cinchoninic Acid in Rheumatoid Arthritis. M. E. Ehrlich, S. Berkowitz, S. G. Carp and others.—p. 227.
Total Gastrectomy: Operative Morbidity and Mortality in Series of 33 Consecutive Cases. G. McNeer and L. Bowden.—p. 231.
Delays and Errors in Diagnosis and Treatment of Endometrial Carcinoma. W. F. Finn.—p. 235.

52:257-384 (Feb. 1) 1952

SYMPOSIUM: CLINICAL ASPECTS OF DISEASES OF LUNGS

Tuberculosis. J. M. Blake.—p. 293.
Bronchogenic Carcinoma. W F. Bugden.—p. 298.
Suppurative Diseases of Lungs and Bronchi. A. A. Ehler.—p. 300.
Contribution of Naval Experience to Human Nutrition. C. M. McCay. —p. 304.
Recollections of Dr. William Henry Welch—A Great Teacher. E. H. Hume.—p. 309.
Physical Medicine for the Neurologic Patient. A. L. Watkins.—p. 315.
Combined Use of Cortisone and Physical Therapy in Treatment of Arthritic Deformities. W. B. Snow and J. A. Coss.—p. 319.
After-Care for the Poliomyelitis Patient. M. Hoberman.—p. 323.
Experimental Revascularization of Rheumatic Myocardium: Preliminary Report A. N. Gorelik.—p. 327.
Surgical Treatment of Diverticulitis of Sigmoid Colon. J. P. West. —p. 329.
Intra-Articular Injections in Osteoarthritis. A. Weissman.—p. 333.
Outpatient Management of Peroral Endoscopy Cases. M. S. Lloyd and M. A. Juster.—p. 337.
Planning New Obstetric Pavilion in the North Country Community Hospital, Glen Cove, New York. R. S. Millen.—p. 340.
Value of Roentgenographic Studies in Treatment of Pilonidal Disease. A. J. Caliendo.—p. 343.
*Triethylene Melamine in Treatment of Hodgkin's Disease and Other Lymphomas. A. Rottino.—p. 346.

Triethylene Melamine in Hodgkin's Disease and Related Disorders.—Rottino discusses his experiences with triethylene melamine in 71 patients with Hodgkin's disease treated in one year. Related disorders were lymphosarcoma in 8, chronic lymphatic leukemia in 8, chronic myeloid leukemia in 6, and acute leukemia in 2. The drug was administered orally as a single 5 mg. tablet to fasting patients one hour before breakfast. In several instances one tablet (5 mg.) was given once per week until symptomatic relief appeared; in other instances 5 mg. were given daily for two to three days and repeated weekly as long as symptoms of the disease persisted. The total dosage varied from 15 to 105 mg., and the large doses were distributed over a period of three months. There was no immediate toxic effect, but in several cases there was loss of appetite, nausea, and vomiting either several hours or 24 hours later. Adverse effects were most noticeable in the hematopoietic system; in many instances there was a sharp decrease in the red and white blood cells and thrombocytes. In patients who showed hematologic depression the bone marrow was aplastic. The average dose producing aplasia was about 45 mg. or more, administered in a period of three weeks. As a rule, the drop in the blood count occurred from two to three weeks after the last dose. In some instances the drop in thrombocytes was accompanied by purpura, bleeding from the gums, headache, and bleeding from the bowels. These hematopoietic complications were controllable by multiple transfusions. Despite marked leukopenia, infections did not occur, probably because of the free use of antibiotics. The results were most impressive in lymphatic leukemia but were less so in lymphosarcoma and chronic myeloid leukemia. In Hodgkin's disease the effectiveness varied, and, in general, the degree could be correlated with the stage of advancement of the disease. Since the drug is toxic, overdosage must be guarded against. An initial dose of 15 mg. over a period of three days may be given safely and in the average case will induce a remission. The fact that it can be given orally and that the patient does not necessarily have to be hospitalized is a great advantage.

Pennsylvania Medical Journal, Harrisburg

54:1113-1240 (Dec.) 1951

Obstetrics in General Practice. C. L. Randall and R. W. Baetz.—p. 1129.
Training the General Practitioner for His Job in Public Health. J. P. Hubbard.—p. 1139.
Nutrition in Liver Disease. R. Tarail.—p. 1144.
Preoperative and Postoperative Nutrition. M. G. Wohl and C. R. Shuman. —p. 1150.
Treatment of Parkinson's Syndrome: Some Practical Considerations. J. C. Yaskin.—p. 1156.

Plastic & Reconstructive Surgery, Baltimore

8:417-504 (Dec.) 1951

Failure of Adrenal Cortical Hormones to Prolong Survival of Homologous Skin Grafts. P. A. Weisman, A. Wight, W. C. Quinby Jr., and B. Cannon.—p. 417.
Failure of Heat Treatment to Prolong Survival of Skin Homografts in Guinea Pigs: Pilot Experiment. P. Weisman and B. Cannon.—p. 428.
Elephantiasis of Lower Limbs: Treatment of Dermo-Fibro-Lipectomy Followed by Free Skin Grafting. R. Farina.—p. 430.
Anatomical Relationship of Lateral Nasal Cartilage to Nasal Bone and Cartilaginous Nasal Septum. B. R. Straatsma and C. R. Straatsma. —p. 443.
Approach to Repair of Extensive Lacerations of Wrist. J. R. Connelly. —p. 456.
More Plastic Incision for Radical Neck Dissections. C. G. Fraser.—p. 465.
New Instrument for Removal of Tattoos. L. Meltzer.—p. 469.
Follow Up on Labial Transplant for Nipple Loss. H. B. Thale.—p. 471.

Postgraduate Medicine, Minneapolis

11:1-82 (Jan.) 1952

Chronic Constrictive Pericarditis: Practical Discussion. M. Dressler. —p. 1.
Detection of Dangerous Paranoid Patient. I. Stevenson and R. A. Matthews.—p. 12.
Antibiotic and Sulfonamide Therapy in Communicable Diseases. S. Karelitz and N. Schifrin.—p. 17.
General Anesthesia for Dental Surgery. R. P. Bergner and R. M. Herd. —p. 26.
Migraine. A. P. Friedman, I. Karron and N. de Sola Pool.—p. 33.
Fibrosarcoma of Extremities. W. P. Kleitsch.—p. 41.
*Serum-Sickness Type of Penicillin Reactions, Treated with Sodium Dehydrocholate. L. Pelner and S. Waldman.—p. 49.
Treatment of Acute Mastoiditis. H. C. Ballenger.—p. 56.
Management of Abortion. G. E. Judd.—p. 58.
Antepartum Care. B. J. Hanley.—p. 62.
Speech Disorders in Children. S. F. Brown.—p. 65.
Management of Anemia in Childhood. M. I. Pierce.—p. 68.
Management of Oral Anticoagulant Therapy. S. Shapiro.—p. 73.

Serum-Sickness Type of Penicillin Reactions.—The occurrence of a reaction simulating serum disease is reported in six men between the ages of 22 and 65 who had been treated with penicillin for severe sore throat, carbuncle on the thigh, phlebitis complicating virus pneumonia, severe Vincent's infection of the mouth, and severe pharyngitis, respectively. The serum-sickness type of reaction to penicillin is characterized by an incubation period of from 7 to 14 days and usually consists of urticaria, angioneurotic edema, itching, fever, migratory joint pains, and joint swelling. Occasionally a purpuric rash is a symptom. One of the authors' patients had an "occult" type of reaction, without a rash, requiring differential diagnosis from many infectious diseases. Gratifying results were obtained with 5 cc. of sodium dehydrocholate (20% solution) given intravenously every day or every other day, depending on the severity of the penicillin sensitivity. In addition, one tablet of dehydrocholic acid (0.24 gm.) was given orally three times daily. In one case the oral method of administration was sufficient to improve the condition. Desoxycholic acid is today the starting point for the synthesis of cortisone in vitro. Cortisone is an effective drug for the treatment of penicillin reactions, and the results obtained with sodium dehydrocholate proved that it is also effective. There is evidence that dehydrocholic acid has at least one of the functions of adrenocortical steroids, that of reducing increased capillary permeability. Increased capillary permeability may be the basis for some allergic reactions.

Psychoanalytic Review, Albany, N. Y.

39:1-114 (Jan.) 1952. **Partial Index**

Successful Treatment of 40-Year-Old Passive Homosexual Based on Adaptational View of Sexual Behavior. J. S. Poe.—p. 23.
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Elucidation of Spontaneous Sensory and Motor Phenomena During Hypnoanalysis. J. M. Schneck.—p. 79.
Sexual Basis of Social Prejudice. R. Seidenberg.—p. 90.

Review of Gastroenterology, New York

19:1-100 (Jan.) 1952

Use of ACTH in Treatment of Ulcerative Colitis. C. W. Wirts and J. L. Carroll.—p. 13.
Association of Tuberculosis with Gastroenteritis: Problems of Gastroenterologist in Tuberculosis. A. X. Rossien.—p. 29.
*Role of Phrenic Nerve in Vagotomy and in Gastrointestinal Mechanisms. H. Necheles and N. C. Jefferson.—p. 39.
Amebic Dysentery. H. B. Shookhoff.—p. 48.
Single and Multiple Polyps or Adenomas of Colon and Rectum—Management. R. R. Best.—p. 57.
Hemorrhoids: Etiology, Pathology and Treatment. (Part III). R. V. Gorsch.—p. 67.

Role of Phrenic Nerve in Vagotomy.—Bilateral vagotomy just below the hilus of the lungs was performed on dogs, and led to dilatation of the stomach and constant vomiting. In another series of dogs both vagus nerves and the left phrenic nerve were sectioned. In these dogs no vomiting occurred, the food left the stomach within a very short period of time, and the dogs appeared normal, except that the stomach was high in the left chest and the air bubble in the fundus was relatively large. No ulcers or serious disturbances were noted in the stomach or intestine of these animals. In performing vagotomy in the dog, complete interruption of the vagus suppply to the stomach could not be achieved by supra or by infradiaphragmatic vagotomy. The profound atony of the stomach that is usually seen following bilateral vagotomy was produced also by simple lifting of the vagus nerves in the chest of the dog. The authors therefore believe that the atony and decrease of the function of the stomach, and the disappearance of ulcer pain following vagotomy, are not due as much to section of the vagus nerves as to a profound shock into which the stomach is put by manipulation or by trauma to the vagus fibers. During their studies of bilateral vagotomy in the dog, cardiospasm was observed in a number of animals. In none of the phrenectomized or vagotomized and phrenectomized dogs was a disturbance of the cardia observed. Additional studies of the effect of left phrenicotomy on the cardia in the dog revealed that it did not produce cardiospasm and that it was able to overcome the cardiospasm often following bilateral vagotomy. Double infradiaphragmatic vagotomy, gastroenterostomy, and left phrenic crush was performed with excellent results in six patients. The patients were out of bed on the first day after operation; none of them vomited, none of them had distention, their stomachs emptied in a short period, and they were all back to work within a few weeks after operation. Roentgenograms before and after operation demonstrated that the stomach moved up into the left chest. Left side phrenic interruption was performed in a patient who had been suffering from cardiospasm for the last five years. The patient lost the cardiospasm, was able to eat without any disturbance, and regained his weight within a few weeks. Section of the phrenic nerve has profound effects on gastrointestinal mechanisms. It shortens the emptying time of the stomach, probably by raising the stomach so that the axis between cardia and pylorus is straightened. Cardiospasm that may follow vagotomy for peptic ulcer or cardiospasm by itself can be overcome by section or crushing of the left phrenic nerve in the neck. Hiccups can be interrupted in man by crushing of both phrenic nerves in the neck.

U. S. Armed Forces Med. J., Washington, D. C.

3:1-170 (Jan.) 1952

Neurosurgery in World War II. W. M. Craig.—p. 1.
Psychoneuroses: Military Applications of Follow-Up Study. N. Q. Brill and G. W. Beebe.—p. 15.
*Frostbite in Korean Casualties. L. G. Bell, L. H. Stahlgren and B. D. Sherer.—p. 35.
Epidemic of Rheumatic Fever in Japan and South Korea. R. E. Blount, J. A. Orbison, A. P. Long and G. N. Schuhmann.—p. 43.
The Royal Army Medical Corps Tradesman. T. P. Buist.—p. 53.
Terramycin in Tuberculous Otitis Media. L. L. Titche.—p. 63.
Intestinal Obstruction. M. N. Jensen and I. K. Ettman.—p. 67.
Combined Pulmonary Tuberculosis and Carcinoma of Lung. A. S. Hambly Jr.—p. 75.
Cold Injuries with Emphasis on Frostbite: Preliminary Report. K. D Orr and D. C. Fainer.—p. 95.
New Local Treatment for Burns. P. E. Spangler.—p. 105.
Combined Streptomycin-Tuberculin Therapy in Pulmonary Tuberculosis: Pilot Study. E. C. Jacobs and J. R. Vivas.—p. 115.
Adenocarcinoma of Appendix. B. R. McCampbell and E. H. Dickinson. —p. 125.
Acne Vulgaris and Urinary 17-Ketosteroids in Young Men. C. B. White, A. Peterson and J. C. Neff.—p. 131.
Paranasal Sinuses: Radiographic Technic. H. A. Vinson.—p. 139.
Chylous Ascites of Unknown Cause. L. W. Olechowski and J. H. Froyd. —p. 143.
Salicylate Intoxication in Children. A. C. Dietrick, H. L. Guard and L. J. Geppert.—p. 149.

Frostbite in Korean Casualties.—The 150 patients reported were of an average age of 21 years, and most of them had been dressed comfortably for cold weather. Footgear consisted of waterproof rubber boots with removable inner soles. Over 75% wore two pairs of woolen socks and most of the remainder wore two woolen pairs and one cotton pair. The enemy attacked with overwhelming force toward the end of November, 1950, when temperatures ranged between —20 and —30 F. The retreating Marines were forced to fight their way toward the coast with few fires, no warming tents, and no warm food. Constantly wet skin involves an increased susceptibility to cold because of its greater conductivity. Over 60% of the victims were frostbitten while pinned down by enemy fire after a long march. They were forced into cramped positions in foxholes where they remained inactive with their feet lying in snow and their socks wet from perspiration. Proper foot care (change into dry socks, massage, and warming with body heat) before the wet footwear froze would have prevented or lessened the severity of the frostbite, but there was rarely time for such measures. Those who were wounded were generally the most severely frostbitten. It is probable that the reflex vasoconstriction from the wounds contributed to the intensity of the local ischemia, thereby increasing the severity of the permanent tissue changes. Other factors such as constricting bandages and immobilization of the part by splinting aggravated the circulatory stasis, and therefore the ischemia. Nearly 50% of the men experienced no symptomatic evidence of frostbite, but it was detected by inspection that revealed discoloration, painless blisters, or swelling of the part. Residual symptoms were not incapacitating, but were present in 95% of the series. Hyperhidrosis and paresthesias in response to temperature changes were the commonest of these. Initial treatment was begun an average of five and one-half days after frostbite was incurred. It consisted of complete bed rest with elevation of the injured part, conservative daily débridement, and intermittent soaking in saline solution. Wet dressings, antibiotics, paravertebral blocks, and grafting were used. Eighteen patients lost significant amounts of tissue, and four of these required major amputations.

Western J. Surg., Obst. & Gynecology, Portland, Ore.

60:1-48 (Jan.) 1952

Surgical Treatment of Carcinoma of Cervical and Upper Thoracic Esophagus. L. A. Brewer III.—p. 1.
Pelvic Endometriosis. H. C. Stearns.—p. 13.
Acute Terminal Ileitis. R. O'Callaghan.—p. 17.
Relief of Colostomy Stricture. D. B. Seabrook.—p. 20.
Fluid and Electrolyte Management in Pediatric Surgery. H. A. Frank, T. N. Hastings and T. W. Brophy.—p. 25.
Flexor Tendon Injuries. R. C. Miller.—p. 32.
Use of Chloroamphenicol in Obstetric Infections. E. S. Taylor and W. C. Scott.—p. 36.
Concerning Anesthesia for Cesarean Section. M. L. Bernstine.—p. 39.

FOREIGN

Archives des Maladies du Coeur, Paris

44:1057-1152 (Dec.) 1951. **Partial Index**

*Angiocardiography in Diagnosis of 200 Cases of Congenital Cardiopathies. P. Soulié, A. Piton and M. Touche.—p. 1057.
Electrocardiogram of Avascular Subacute Pulmonary Heart Disease. F. C. Arrillaga and L. de Soldati.—p. 1088.
Hemodynamic Study of 10 Cases of Isolated Persistent Patent Ductus Arteriosus. G. Voci, M. Touche and F. Joly.—p. 1103.

Angiocardiography in Diagnosis of Congenital Cardiopathies.—Angiocardiography became essential when effective surgical procedures for congenital heart disease were introduced, since definite diagnosis is necessary before surgery is undertaken. The surgeon requires from the cardiologist precise information in regard to the cardiac or vascular area in which he intends to operate and to anomalies that may make the procedure more difficult, such as abnormal venous return, right aortic arch, and abnormal position of the aorta or its branches. The authors do not believe that selective or regional angiocardiography should replace standard angiocardiography.

Bol. del Colegio Méd. de Camagüey

14:345-438 (July-Dec.) 1951. **Partial Index**

Thoracoplasty in Pulmonary Tuberculosis. M. Sorí Marín.—p. 347.
Study and Treatment of Eclampsia. R. A. Santayana.—p. 355.
Soft Chancroid: Statistical Study of 187 Cases. R. Simón del Blanco. —p. 373.
*Hepatitis from Homologous Serums. J. A. Pichardo Rubio.—p. 412.

Homologous Serum Hepatitis.—Pichardo Rubio applies the term homologous serum hepatitis to either syringe hepatitis or viral hepatitis when the latter is due to transfusion with blood of a donor within the period of incubation of viral hepatitis. In a period of three and one-half months 31 patients had blood transfusions at the Sanatorio de la Colonia Española de Camagüey. Follow-up observation of the patients proved that there was no complication to transfusion. In the same period a professional donor gave blood to six patients. At the end of that period he entered the hospital with virus hepatitis. Only the patient who had a transfusion 100 days before appearance of clinical symptoms of viral hepatitis in the donor did not develop the disease. All the patients who had transfusion with this donor's blood within 88 days of the appearance of clinical symptoms developed viral hepatitis. Two patients died. Three cases are described here. The period of incubation was shorter, and jaundice and the disease were more acute as the period of incubation in the donor advanced in relation to the date on which he had given blood. The symptoms and course of the disease were much more acute in the patients than in the donor. Hepatomegaly was more marked than in syringe hepatitis. The diagnosis was confirmed by the results of a liver biopsy. The three patients as well as the donor reacted well to the usual treatment of the disease, including rest, a proper diet, and injections of dextrose, liver extract, and vitamins.

British Medical Journal, London

1:119-174 (Jan. 19) 1952

*Streptomycin in Ophthalmology. A. Sorsby, J. Ungar and N. L. Bailey. —p. 119.
Clinical Features of Pneumonias Undergoing Virus Tests. G. H. Jennings. —p. 123.
Role of Statistics in Regional Hospital Planning, with Special Reference to the Birmingham Hospital Region. V. Norris.—p. 129.
Primary Tuberculous Pleural Effusion in Older Age Groups. R. F. Robertson.—p. 133.
Radiological Changes in Skull in Dystrophia Myotonica. J. E. Caughey. —p. 137.
Bullous Lesions in Leukaemia. R. Scutt.—p. 139.
*Ovarian Denervation for Ovarian Dysmenorrhoea: Review of 70 Cases. D. C. Wiseman and W. M. Thomas.—p. 141.
Epidemiology of Human Case of Bacillary Dysentery Due to Infection by Shigella Flexneri 103 Z. K. P. Carpenter and B. R. Sandiford.—p. 142.

Streptomycin in Ophthalmology.—It is generally accepted that tuberculosis of the conjunctiva, cornea, iris, and retinal veins is secondary to a general infection. This does not exclude the possibility that local therapy has some value, but does emphasize that exclusively local therapy is unlikely to prove satisfactory. In infections with gram-negative bacilli the lesion is entirely local, and local treatment may give the desired results. Sorsby and associates studied the concentrations that can be reached in the eye by the systemic and subconjunctival injection of streptomycin. They also investigated the efficacy of such therapy in experimental infection of the cornea by Pseudomonas pyocyanea, and tried to estimate its clinical value. They found that 0.5 gm. of streptomycin in 1 ml. of water is well tolerated on subconjunctival injection, and that this method of administration produces considerably higher intraocular levels than intramuscular injection. The intraocular levels are still higher and persist up to 36 hours if epinephrine 1:1,000 is the solvent. In the experimental animal a destructive Ps. pyocyanea infection of the cornea is fully controlled by one subconjunctival injection of 0.5 gm. of streptomycin in 1 ml. of epinephrine 1:1,000. For clinical purposes streptomycin to be injected subconjunctivally should be dissolved in 0.6 ml. of water to which 0.3 ml. of epinephrine 1:1,000 has been added. Clinically streptomycin is effective when used subconjunctivally in infections of the cornea due to gram-negative bacilli. As these lesions are highly destructive, early treatment is essential, and the characteristic clinical appearance of such infections facilitates early diagnosis. Streptomycin locally is also invaluable in acute conjunctivitis due to gram-negative bacilli. Systemic administration of streptomycin proved helpful in tuberculous keratitis, but gave poor results in presumably tuberculous iridocyclitis and in periphlebitis. In phlyctenular ophthalmia it tended to cut short severe attacks, and probably reduced the frequency and severity of relapses.

Denervation for Ovarian Dysmenorrhea.—That the ovary could be the source of pain in some cases of dysmenorrhea was first pointed out in 1925, and in 1939 it was suggested that a painful ovary could be rendered insensitive by denervation, an operation that is less severe than presacral neurectomy. Wiseman and Thomas describe 70 patients with ovarian dysmenorrhea in whom they performed bilateral ovarian denervation. They used a midline subumbilical paramedian incision, and subdivided the infundibulopelvic ligaments between clamps as near the ovary as possible so that all the nerve fibers might be included in the clamps. The divided ends were ligated with catgut, and care was taken, when ligating the medial pedicle, that the fallopian tube was not kinked. If the ovary tended to fall into the pouch of Douglas, the ovarian ligament was shortened by a catgut stitch. The following additional procedures were carried out: Gilliam's suspension in 12 cases, cyst resection in 34, appendectomy in 19, and myomectomy in 3. At examination six weeks after the operation 56 were cured, 12 were improved, and 2 were unchanged. In a follow-up study from six months to three years after the operation 65 of the 70 patients could be traced, and 61 were either cured or improved and 4 were unchanged. The authors resort to denervation of the ovaries only when bimanual compression of the ovaries accurately reproduces the pain, and they feel that it should be done in young women in whom appendicitis is not found at operation.

Deutsche medizinische Wochenschrift, Stuttgart

77:1-32 (Jan. 4) 1952. **Partial Index**

*New Method for Cytologic Diagnosis of Gastric Diseases. N. Henning and S. Witte.—p. 1.
Diagnosis of Menstrual Cycle from Unstained Vaginal Secretion with the Aid of Phase Contrast Microscope. O. A. Roth.—p. 4.
Case of Spotted Fever (Brill's Disease) in Northern Germany. H. Binde, S. Kramer, G. Preuss and F. Weyer.—p. 5.
Sjögren's Syndrome. W. Beiglböck and H. Hoff.—p. 7.
Treatment of Gastritis. W. Brühl.—p. 11.
Diuretic Action of Several New Derivatives of Theophylline. F. Hildebrandt.—p. 13.

Cytological Diagnosis of Stomach Diseases.—Henning and Witte point out that adaptation of Papanicolaou's method of cytological examination for examination of desquamated cells of the gastric mucosa proved difficult at first, because of the destructive effect of the gastric juice on the cells. Later biopsy specimens were obtained by means of the gastroscope and were used for the cytological examination. In this paper the authors are concerned with the results obtained by means of the "cell tamponing" method. A rubber sponge was inserted into the stomach inside of a soft stomach tube. When the tube was in proper position in the stomach, the sponge was pushed forward by means of a mandrin. After the sponge had been brushed along the gastric wall, it was withdrawn into the tube. After removal of the tube from the stomach, the rubber sponge was washed off with isotonic sodium chloride solution, and the fluid thus obtained was centrifugated. Part of the sediment was examined at once under the phase contrast microscope, and smears were prepared from the remainder of the *sediment. This* technique was employed in 145 patients, including some without gastric disturbances and others with hyperacidity, achylia, pernicious anemia, or carcinoma, and the characteristics of the desquamated cells in these disorders are described. As regards the use of this "cell tamponing" method in gastric cancer, the authors say that it is most reliable in the presence of carcinoma of the esophagus and is least reliable in tumors in the region of the antrum. The method corroborates results of roentgenologic and gastroscopic examinations, and is particularly helpful in diagnosis of lesions in the region of the cardia and of the fundus.

Journal de Chirurgie, Paris

67:849-952 (Dec.) 1951

Evacuation of Contents of Stomach After Gastric Resections (Billroth I and II Operations). J.-M. Wollesen.—p. 849.
*Some Physiopharmacologic Aspects of Intra-Arterial Injections of Therapeutic Agents. J. Garrett.—p. 854.

Intra-Arterial Injections of Therapeutic Agents.—Experiments were performed on dogs with intra-arterial injections of 0.25 and 0.10 gm. of sodium *p*-sulfamidophenylamino sulfonate ("pentalom"). Results suggested that a large amount of the drug injected into the arteries passes into the tissues locally, while during the 24 hours after the injection an effective concentration of the drug in the blood of the general circulation could not even be obtained in the presence of stasis. Massive doses of chloroform then were injected intra-arterially and intravenously. Microscopic examination revealed that the hepatic and renal lesions produced in these animals were much more extensive and the mortality was higher when chloroform had been injected intravenously than when it had been injected intra-arterially. Intra-arterial injections of epinephrine and acetylcholine caused local vasomotor changes without exerting any significant effect on the arterial tension. Procaine hydrochloride, merbromin, sulfonamides, and penicillin when injected intra-arterially had no significant effect on the respiratory movements and the systemic arterial tension. The absence of a marked general effect of the drugs administered intra-arterially suggests that it will be possible to employ therapeutic agents by this route to obtain a local effect, when intravenous administration may not be possible in doses large enough to obtain the desired local effect. Additional experiments showed that intra-arterial injections of procaine hydrochloride, merbromin and sulfonamides did not exert any adverse effect on leukocytic phagocytosis, although repeated intra-arterial injections of high doses of procaine hydrochloride occasionally stimulated the phagocytic activity of the white blood corpuscles contacted by the drug. Variations in the arterial pressure were studied in dogs for one and a half hours after injections of procaine hydrochloride, merbromin, sulfanilamide, "pentalom," penicillin, distilled water and hypertonic 25:1,000 sodium chloride solution into the femoral artery and occasionally into the iliac arteries. In addition arteriograms were taken within 3 to 40 minutes of intra-arterial injections. Results showed that the drugs produced transitory vasoconstrictor phenomena in the injected artery and all its branches; these phenomena usually did not last longer than 30 minutes. Secondary vasodilatation of the arteriolocapillary network then occurred in direct proportion to the initial vasoconstriction and continued for more than 24 hours. These vasomotor phenomena were insignificant after the intra-arterial injections of distilled water, "pentalom," and penicillin, moderate after sulfanilamide injections, somewhat more pronounced after merbromin, and most pronounced after the injections of hypertonic sodium chloride solution. Procaine hydrochloride produced pronounced vasodilatation immediately after the injection without initial *vasoconstriction*. It is suggested that the initial vasoconstriction originates from a nervous reflex, while the secondary vasodilatation may be considered as paresis due to transitory loss of the autonomous vascular tonus. The increased capillary permeability that should be associated with this vasodilatation may facilitate passage of the drug from the vessels into the tissues, with considerable effect of the drug on the infected region. Leukocyte counts made before and after the intra-arterial injections demonstrated that the changes in the leukocytes caused by the injections may not play a significant part in the anti-infectious action of the therapeutic agents injected intra-arterially.

Lancet, London

2:113-166 (Jan. 19) 1952

Treatment of Peptic Ulcer. J. W. Todd.—p. 113.
*Intra-Ocular Acrylic Lenses After Cataract Extraction. H. Ridley.—p. 118.
Effect of Adrenal Extract on Mineral Metabolism. J. F. Tait, S. A. Simpson and H. M. Grundy.—p. 122.
*Imbibition of Fluid as Cause of Herniation of Nucleus Pulposus. J. Charnley.—p. 124.
Nisin in Experimental Tuberculosis. E. M. Bavin, A. S. Beach, R. Falconer and R. Friedmann.—p. 127.
Evaluation of Eosinophil-Count. J. N. Swanson, W. Bauer and M. Ropes.—p. 129.
Silicosis in Ball-Clay and China-Clay Industries. R. W. Thomas.—p. 133.
Penicillin-Resistant Staphylococci: Distribution Among Outpatients. G. A. C. Summers.—p. 135.

Intraocular Acrylic Lenses After Cataract Extraction.—Ridley, after reviewing the history of operations for cataract, states that since 1949 it has been possible to substitute for the opaque crystalline lens an artificial intraocular lens capable of producing an excellent visual result. All the disadvantages of aphakia, except lack of accommodation, can be overcome by the use of an intraocular lens. The problems to be solved were threefold: (1) to select a suitable transparent material that would not produce a tissue reaction; (2) to determine the size and refractive power of the lens; and (3) to devise a method of inserting and retaining the lens in position within the eye. A form of polymethyl methacrylate is best suited to the purpose, because its composition and optical properties are constant, and, being unpolymerized, there is no risk of gradual liberation of free polymeriser that might cause chemical irritation. The refractive index is 1.49 and the specific gravity 1.19. Since it cannot be boiled without risk of distortion and is affected by organic solvents, including alcohols, sterilization was done with 1% cetrimide. The intraocular lenticuli were made about 1 mm. less in diameter than the natural lens, for ease of insertion and to obviate pressure on the ciliary region and filtration angle, which might tend to produce cyclitis and glaucoma. The first lenses were made 8.35 mm. in diameter, with curvatures of the radii equal to those of the natural lens. But in the human eye it was found that such a lens was too strong. The present lens specifications are presented and the technique of the operation, which is more complex than simple extraction, is described. In the 25 eyes that have been subjected to this operation the results in the first 2 are unsatisfactory because the acrylic lenses were too strong, producing postoperative myopia. Binocularly, the visual result is a little worse, than with simple extraction. In the remaining 23 eyes serious difficulty has developed in only 1. Results in the other 22 cases are successful in that binocularly the visual result is better than it would have been with simple extraction alone.

Fluid Imbibition as Cause of Herniation of Nucleus Pulposus.—It is customary to suppose that protrusion of an intervertebral disk is the result of external mechanical factors acting on the spine. To make this explanation more acceptable, it has been suggested that the disk that herniates is not normal, and that a force that could not harm a normal disk might affect a "degenerating" disk. However, this explanation is not satisfactory, because the "degenerative" process seems to be mainly one of dehydration, and this is not the physical state that would predispose to protrusion. In this report Charnley presents clinical and experimental evidence that protrusion of a nucleus pulposus might result from intrinsic causes in the disk, and that in certain circumstances the nucleus may swell and extrude itself spontaneously. There are several features in the lumbago-sciatica syndrome that make it difficult to postulate an external mechanical cause: 1. Though the acute lumbago syndrome can follow sudden severe strains in lifting heavy weights, oftener it starts without recognizable injury. 2. The lumbago-sciatica syndrome often follows exposure to wet and cold. 3. The pain of acute lumbago is quite unlike the pain that follows a severe injury to the spine. 4. Severe injuries of the spine rarely cause immediate sciatica. 5. A sudden, violent attack of sciatica is often preceded by a prodromal phase. The experimental evidence presented here was obtained after imbibition of isotonic or hypertonic sodium chloride solutions by intervertebral disks in the lumbar spine of fresh human cadavers. It has been generally accepted that the nucleus pulposus contains a substance of the nature of a mucopolypeptide with hydrophilic properties. It is now postulated that under certain conditions the disk may absorb an abnormal amount of fluid, producing an abnormally high internal pressure, and that this sudden tension inside the disk may result in acute lumbago. The conditions that could precipitate this episode of hypertension might be varied and, though unlikely, could even be infective as, for instance, after exposure to wet and cold. Once the pressure has risen inside the disk, a protrusion may start, and thereafter slight injury may complete the bursting of the annulus. An external protrusion impinging on a nerve root may then cause sciatica. If this hypothesis proves correct, prophylactic medical treatment of lumbago may become possible.

Minerva Pediatrica, Turin

3:571-614 (Nov. 1) 1951. **Partial Index**

- *Clinical and Roentgenologic Contribution to Knowledge of Mediastinal Pleurisy in Children. P. Menghi and L. Parenzan.—p. 571.
- Behavior of Antigens of Eberthella Bacillus Isolated from Patients Treated with Various Therapies. L. Bavastrelli.—p. 579.
- *Cor Triloculare Biatrium: Angiocardiographic Confirmation. R. Bulgarelli.—p. 582.

Mediastinal Pleurisy in Children.—In the last 16 years mediastinal pleurisy was observed in 15 children from 45 days to 10 years old. In seven cases the disease was secondary to homolateral pulmonary tuberculosis and in seven to bronchopneumonia of unknown origin. In one case determination of the cause was difficult because rheumatic disease was associated with a tuberculous process. In three patients the mediastinal pleurisy was associated with diaphragmatic pleurisy and in two with interlobular pleurisy. In six the process involved the right posterosuperior area. Because the general condition of the patients remained good and physical manifestations (cough, dyspnea, and headaches) were rare, the roentgenologic examination was important in the diagnosis. The authors discuss the characteristic changes revealed on roentgenograms, which vary according to the area involved, and suggest the use of body section roentgenography and of oblique and lateral view roentgenograms. They also discuss the differentiation of mediastinal pleurisy and hypertrophic thymus, pericarditis, tracheobronchial adenopathy, aneurysm of the aorta, mediastinal abscess, chronic mediastinitis, esophageal diverticulitis, and megaesophagus. It is most important to determine whether the process is tuberculous, and this is easily done in children by testing their intradermal reaction to tuberculin. Treatment was the same as that for common pleurisy, and various drugs were given according to the etiology of each case. Local application of drugs and surgical treatment, which should be limited to severe cases, were avoided. Aspiration by puncture was performed only in one patient in whom signs of mediastinal compression were present. Sulfonamides and antibiotics were given to the children who were observed after these drugs became available. Recovery occurred in all the patients, the disease lasting from 1 to 4 months in those with nontuberculous mediastinal pleurisy, and from 2 to 12 months in those with tuberculous forms. The regression was evidenced in the roentgenograms by gradual reduction of the extension of the shadow, which had irregular and faded margins.

Cor Triloculare Biatrium.—This rare congenital anomaly is reported in a girl, 4½ years old, with a history of pronounced cyanosis at birth and frequent attacks of bronchitis, asphyxia, and dyspnea. Diagnosis of congenital heart disease was made when the patient was 4 months old. On admission she had marked cyanosis of the face, mucous membranes, and extremities, clubbed fingers, and edema of the legs. The pulse rate was 125 per minute, respiratory rate 28, and blood pressure 80/50 mm. Hg. Percussion revealed pronounced enlargement of the heart, and a slight murmur, which lacked the characteristic rasping quality of most congenital heart diseases, was heard over the precordium. An enlarged liver was felt. Blood examination revealed a hemoglobin level of 140%, 6,000,000 erythrocytes, and 8,000 leukocytes. Electrocardiograms, which revealed an abnormal P wave, especially in lead 2, and a prolonged PQ interval, were of little value for the diagnosis. Roentgenograms revealed an enlarged heart and absence of the shadow of the interventricular septum. Six angiocardiograms were taken, and these were decisive in the diagnosis. Soon after injection of the contrast medium, not only the area corresponding to the right ventricle was opaque but also the area corresponding to the left ventricle, indicating that there had been no obstacle to passage of the contrast medium from one area to the other. A normal-sized pulmonary artery was also opaque, while a small-sized aorta could not be seen well. A fourth angiocardiogram, taken four and one-half seconds after the first, revealed that the contrast medium, having traversed the pulmonary circulation and the left auricle, reappeared in the common ventricle and passed freely from the area corresponding to the left ventricle to that corresponding to the right ventricle. Diagnosis was made of cor triloculare biatrium, with transposition of the great vessels. This rare congenital heart anomaly is a malformation resulting from an extremely early arrest in the development of the heart. There is only one ventricle, since the interventricular septum is missing, but there is generally a rudimentary cavity that results from the persistence of the bulbus cordis. There are three types of cor triloculare biatrium. In the first type the normal-sized aorta springs from the common ventricle and a small pulmonary artery originates from the rudimentary chamber. In the second type, with the arrested development of the ventricle there is also transposition of the great vessels, a small-sized aorta arising from the rudimentary chamber, and a normal-sized pulmonary artery from the common ventricle. In the third type, both vessels arise from the rudimentary chamber and are of approximately the same reduced size. Clinical and radiological findings, angiocardiograms, and differential diagnosis of the three varieties of cor triloculare biatrium are discussed.

Nederlandsch Tijdschrift v. Geneeskunde, Amsterdam

95:3717-3812 (Dec. 15) 1951. **Partial Index**

- Case of Herpes Zoster Encephalitis. W. Briët and H. R. van der Molen. —p. 3732.
- Treatment of Perforated Gastric and Duodenal Ulcers at a Clinic in Groningen from 1938 to 1950. H. J. Oterdoom and W. H. A. Quast. —p. 3737.
- Reliability of Combined Pregnancy Tests According to Galli Mainini and Konsuloff. J. C. A. Mighorst.—p. 3755.
- *Familial Occurrence of Ankylosing Spondylitis (Bechterew's Disease). J. J. de Blécourt.—p. 3763.
- *Macrocytic Anemia Refractory to Liver Therapy. A. A. Scherpenhuysen. —p. 3766.
- Active Constituents of the Serum in Thymol Turbidity Reaction. H. Dekema.—p. 3774.

Familial Occurrence of Ankylosing Spondylitis.—The 296 patients with ankylosing spondylitis (Bechterew's disease) reviewed by de Blécourt belonged to 239 families; 96 cases occurred in 39 families and the remaining 200 cases were the only ones in a family. In two families there were four cases, and in one family five cases. Another interesting observation in this group was that 70 of 296 patients, or nearly one-fourth, were women. This percentage is considerably higher than the average of 10% usually given in the literature. In view of the rather high familial occurrence, the author suggests that by examining the members of the families of patients with ankylosing spondylitis, it might be possible to detect some cases quite early.

Macrocytic Anemia Refractory to Liver Therapy.—Disturbances in the digestion of fat were observed in two patients who had had anemia for a number of years. At the same time the anemia became hyperchromic and the bone marrow showed a megalocytic character. In one patient the disorder developed during pregnancy. Both patients had normal gastric acidity. Improvement resulted from treatment with folic acid, but not from treatment with liver preparations or vitamin B_{12}. One of the patients developed a severe allergic reaction to folic acid, and both patients had abnormal pigmentations. The author cites reports from the literature in which brownish skin pigmentation was observed in anemia that was refractory to liver therapy. Postmortem examination disclosed in some of these cases other signs of hemachromatosis, but the blood sugar curve was normal.

Nordisk Medicin, Stockholm

46:1847-1866 (Dec. 12) 1951. **Partial Index**

Advisability of Routine Blood Transfusions in Operations (Based on Review of 345 Stomach Operations). O. Noring and K.-E. Sjölin.—p. 1851.
*Late Juvenile Diabetes. L. Recht.—p. 1855.
Persisting Bacteriuria in Children: Follow-Up. T. Ive.—p. 1858.

Late Juvenile Diabetes.—Follow-up examination of 31 patients with juvenile diabetes observed for at least 10 years revealed that six were dead. The average age at the onset of diabetes was 12.7, and the average age at death was 27.3. Of the two who died from uremia one had Kimmelstiel-Wilson's syndrome, and in this case intracapillary glomerulosclerosis was confirmed at necropsy. Three died from pulmonary tuberculosis, and one died in diabetic coma. Of the surviving 25 patients, 24, with average age of 27.4 and average duration of diabetes of 15½ years, were examined objectively: in 12 Recht found albuminuria; in 8, edema; in 8, urea clearance of less than 45 cc. per minute; in 6, hypertension; in 16, retinal hemorrhages; in 4, blood cholesterol levels of more than 300 mg. per 100 cc.; and in 6, hemoglobin values of less than 75%. Four patients were free from symptoms. A correlation was established betwen kidney and eye symptoms. No relation was demonstrable between the incidence of complications and control of the diabetes or type of diet.

Pediatria, Naples

59:621-786 (Sept.-Oct.) 1951. **Partial Index**

*Juvenile Progressive Paralysis: Description of Five Cases. R. Ruggerf.—p. 621.
Presence of Leukocytolysins in Blood During Serum and Histamine Shock. F. Recchia, L. Ravazzoni, and M. Ghiron.—p. 634.
Intestinal Intussusception in Infants: Analysis of 55 Cases. W. Galluzzi and A. Gianelli.—p. 644.

Juvenile Progressive Paralysis.—Juvenile progressive paralysis is reported in five children, 7, 9, 10, 11, and 12 years old, respectively, with a history of normal development prior to onset of the disease. As progressive deterioration of the psychic faculties and changes in behavior characterized by lack of initiative and abulia occurred, some patients who had been good students up to the fifth grade could not even recognize the letters of the alphabet. None of these phenomena was considered for an early diagnosis, and the patients were seen only years later. On examination, signs of congenital syphilis were hard to detect in some patients, and tuberculosis and alcoholism were not found in the parents. Anisocoria with little or no reaction to light and accommodation was present in all patients; two had pronounced tremor, one dysarthria, two spastic paraparesis, and one, who subsequently became unable to speak, had severe epileptic attacks. Malariotherapy, pyretotherapy, arsphenamine, and bismuth gave good results in the first patient who, 15 years after the onset of the disease, is an efficient mechanic despite a slight mental defect. Treatments were not effective in the other patients, the third of whom died from marasmus after three years. The effects of penicillin administered intrathecally and subcutaneously could not be evaluated in the fourth patient. The fifth patient is still hospitalized. The author attributes these poor results to the fact that the correct diagnosis was made too late, and suggests that, whenever mental deterioration is observed in children, diagnosis of juvenile progressive paralysis be made and cerebrospinal fluid be examined. Early diagnosis and treatment with malariotherapy, antisyphilitic drugs and penicillin may ameliorate the prognosis that to the present has been unfavorable.

Philippine Medical Association Journal, Manila

27:639-732 (Nov.) 1951

Studies on the Lepromin Reaction: Preliminary Report. H. W. Wade.—p. 639.
Dietary and Nutritional Approach to Some Medical and Public Health Problems in the Philippines. A. C. Regala, C. R. Pascual, L. C. Santiago and A. P. Bautista.—p. 645.
Statistical Study of 177 Cases of Hydatidiform Mole Admitted to Philippine General Hospital from April 6, 1945, to December 31, 1950. H. A. Sison and H. B. Panlilio.—p. 652.

Prensa Médica Argentina, Buenos Aires

38:2833-2906 (Nov. 2) 1951. **Partial Index**

Indications for Lobectomy in Treatment of Bronchogenic Carcinoma. H. D. Aguilar and R. F. Brignone.—p. 2833.
Antihistamines and Pregnancy. S. Castro and E. Koremblit.—p. 2837.
Treatment of Hypertensive Vascular Disease with Kempner Diet and Low Sodium Diets. F. Motoreano and H. Rabenko.—p. 2849.
*"Trial" Chemical Lobotomy: Procaine (Novocaine®) Hydrochloride Prefrontal Block: Preliminary Report. E. E. Krapf and J. H. Lyonnet.—p. 2866.
Treatment of Massive Gastroduodenal Hemorrhages. A. R. Albanese.—p. 2875.

"Trial" Chemical Lobotomy: Prefrontal Block with Procaine Hydrochloride.—Uncertainty of the outcome of prefrontal lobotomy, which sometimes produces undesirable personality changes not compensated for by improvements in conduct, led the authors to consider the possibility of carrying out a "trial" lobotomy. Three patients with severe psychiatric symptoms were selected for the experiment, and procaine (novocaine®) hydrochloride, which had proved harmless when injected into the brain, was used in the procedure. Two simple trepanations were made with the patient under local anesthesia, without premedication, at the classic sites for lobotomy according to Freeman and Watts. The ventricles were located, and 4 cc. of 2% procaine hydrochloride was injected very slowly in the plane of the coronal suture, on each side in each of four locations from above downwards. Infiltration was followed by improvement, which continued for several days and then gradually declined. The favorable results obtained from the procaine block indicated that lobotomy would be successful, and it was carried out. The symptoms of all three patients were relieved and two were discharged to their homes. Further studies are being carried out, and it may be that a series of prefrontal procaine injections will bring about a cure without the necessity of operation.

Presse Médicale, Paris

60:1-20 (Jan. 5) 1952. **Partial Index**

*Suprahyoid Distention on Inspiration in Poliomyelitis. P. Sédallian, F. Jourdan, A. Bertoye and others.—p. 1.
*Intravenous Administration of *p*-Aminosalicylic Acid in Pulmonary Tuberculosis. J. Paraf, P. Zivy, J. Bory and others.—p. 3.

Suprahyoid Distention on Inspiration in *Poliomyelitis.*—A distention of the suprahyoid region with each inspiration, resembling in extreme cases the submaxillary movements accompanying the breathing of the frog, has been observed in patients with poliomyelitis and severe myelitis. This symptom may appear before any other sign of bulbar involvement, independently of the classic signs of such involvement, and at a time in the course of respiratory paralyses of the spinal type when everything seems to warrant the belief that use of an artificial respirator will relieve the patient. Investigation of the mechanism of this distention shows that activity of the suprahyoid muscles is normally inhibited by the reflex route. Appearance of suprahyoid distention is caused by simultaneous involvement of both inhibitive centripetal pathways, either by numerous peripheral injuries, or by bilateral injury to the pneumogastric nerves between the point of their emergence from the medulla oblongata and the point where the superior laryngeal nerves originate, or by a functional lesion of the intramedullary nucleus upon which the centripetal pneumogastric nerves converge. Suprahyoid distention thus results from bilateral interruption of the centripetal vagal fibers and can only be explained by a bulbar lesion.

***p*-Aminosalicylic Acid Given Intravenously in Pulmonary Tuberculosis.**—The development of a new, stabilized, apyrogenic solution containing 15 gm. of *p*-aminosalicylic acid per 500 cc. has made it possible to give daily infusions for from 30 to 60 days. The results obtained by this method indicate that *p*-aminosalicylic acid is the most efficacious medication now available for use in pulmonary tuberculosis. The first infusions should be given slowly (40 drops a minute during the first quarter hour, rising to 100 to 120 drops a minute if no unfavorable reaction occurs); later ones may be timed so that the 500 cc. are given in an hour and a half. Digestive disturbances that often accompany oral administration of *p*-aminosalicylic acid are rarely observed; colic sometimes occurs, but is easily controlled by belladonna. Contraindications are chiefly nephritis (except renal tuberculosis), diabetes, cardiac decompensation, and phlebitis. Infusions during pregnancy are well tolerated and have proved highly useful. *p*-Aminosalicylic acid is effective when given by intravenous infusion because the high blood concentrations enable the drug to enter the bronchi or cavitary spaces and act directly on the lesions. It liquefies caseous material, facilitating its evacuation and the revascularization of the wall of the cavity. This twofold action, helped by bacteriostasis, makes regrowth of tissue possible. These effects and its action on bronchial lesions explain the favorable results of intravenous *p*-aminosalicylic acid therapy in cases with cavitation. Two or three weeks of infusions are often needed for improvement or closure of cavities; noncavitary lesions and recent or nodular foci yield more rapidly to treatment. Results may be judged in from 15 to 30 days; after this period, progress is usually limited. The shortness of this time is advantageous; decision in regard to collapse therapy, which is usually indicated, is not unduly delayed and development of *p*-aminosalicylic acid resistance is prevented. Results obtained by this method in from 80 to 90% of cases are excellent; in 30% of cases of recent pulmonary tuberculosis with cavitation complete cure is obtained (supportive treatment and prolonged rest are needed for consolidation); and in 60% improvement occurs but collapse therapy is required to bring about perfect healing. Streptomycin may be combined with intravenous *p*-aminosalicylic acid, if needed; indications for its use are severe attacks of pneumonia and bronchopneumonia, as well as miliary tuberculosis and tuberculous meningitis, in which the synergistic action of the two products is especially valuable.

Quarterly Journal of Medicine, Oxford

20:313-448 (Oct.) 1951

Artificial Pneumothorax: Survey of Personal Series. F. Scadding, H. Nicholson and C. Hoyle.—p. 313.
Heredity of Hypertension in Diabetes Mellitus. H. W. Balme and L. Cole.—p. 335.
Use of Radioactive Iodine in Assessment of Thyroid Function. J. F. Goodwin, A. G. Macgregor, H. Miller and E. J. Wayne.—p. 353.
Influence of Intravenous Digoxin on Renal Function in Congestive Cardiac Failure. P. H. Davison and R. Gaddie.—p. 389.
Infective Hepatitis and Cirrhosis of Liver. P. B. Fernando and R. S. Thanabalasunderam.—p. 403.
Observations on Symptomatology and Pathogenesis of Hepatic Coma. J. M. Walshe.—p. 421.

Revista Española de Tuberculosis, Madrid

20:599-658 (Oct.) 1951

*Treatment of Pulmonary Tuberculosis with Pneumothorax and Intrapleural Injections of Streptomycin. J. Abelló.—p. 599.
Treatment of Giant Cavities of Upper Lobe. L. Sagaz.—p. 643.

Pneumothorax and Intrapleural Injection of Streptomycin in Tuberculosis.—Streptomycin and other antibiotics administered intrapleurally to patients subjected to pneumothorax do not irritate the pleura and are absorbed completely. Intramuscular administration of the antibiotics should continue, being interrupted only on the days when the intrapleural injection is given in order to avoid excessive dosage. Intrapleural administration of antibiotics combined with collapse therapy causes rapid disappearance and cicatrization of the lesions on both sides and shortens the treatment period. A mixture of procaine and potassium penicillin and dihydrostreptomycin ("syncrobin") has proved effective against many bacteria, producing a high concentration in the tissues through the action of the soluble potassium salt of penicillin and maintaining it by the less soluble penicillin procaine G, while the dihydrostreptomycin combats the organisms resistant to penicillin. Streptomycin and the penicillin-dihydrostreptomycin mixture are especially valuable in treating empyema; after intrapleural injection of these medications, the pleural effusion rapidly becomes clear and sterile. Intrapleural injection is indicated when prompt application of the antibiotic to the lesion is needed, as in exudative lesions, cavities with extensive inflammation, and serious bilateral lesions. The injections, which should be given slowly with fine needles in order not to injure the parietal pleura, may begin with the third puncture for pneumothorax. The pleura should not be irritated by prolonged treatment; when optimum collapse has been secured and tomography shows the lesions to be undergoing cicatrization, intrapleural injections should be discontinued. Intramuscular administration of the antibiotics should be maintained, and the surgical or other treatment indicated by the patient's condition should not be abandoned or varied.

Rev. Fac. Cienc. Med. Univ. Nac., Córdoba

9:441-722 (July-Dec.) 1951. **Partial Index**

*Papilliferous Adenomas of Breast. J. González Warcalde and L. V. Ferraris.—p. 441.
*Cancer of Endometrium Before Menopause. M. Alberto Freire.—p. 453.
Arterial Circulation of Tympanic Membrane. G. O. Suárez.—p. 467.
Thrombophlebitis of Right Upper Petrous Sinus and Paralysis of Third Cranial Nerve. O. Luque and R. Pucheta Morcillo.—p. 477.
Difference Between Vitamin and Hormone. J. Eliseo Pagano.—p. 525.
Uremia Caused by Low Ureteral Obstruction in Cancer of Neck of Uterus. J. M. Dionisi.—p. 533.

Papillary Adenomas of the Breast.—In a period of 30 years 17 cases of papillary adenomas of the breast were observed in the Instituto de Anatomia Patológica of the University of Córdoba. The majority of the patients were between the ages of 40 and 50 years. Seven patients complained of hemorrhage from the nipple that had lasted between 1 and 2 years. The tumor was of the glandular or pseudoglandular form in 13 cases. The histological study of the tumoral tissues showed zones of cylindrical and of transitional epithelial cells in three cases and evident carcinomatous transformation of the cells in two cases. The author concludes that papillary adenomas of the breast are potentially malignant and necessitate removal of the tumor with ample excision of the breast. A careful anatomicopathologic study of the cystic walls and of the peritumoral tissues is advisable.

Cancer of Endometrium Before Menopause.—In a period of nine years 102 cases of cancer of the endometrium were observed in the Instituto del Cancer of the University of Córdoba. Thirty-nine patients were young women. The disease is more frequent in single women and in women who use contraceptive measures than in women who have had children. It is also more frequent in patients with arterial hypertension or diabetes. Frequently endometrial cancer follows a theca cell tumor. It is never observed in castrated women. Endometrial cancer in young women has no characteristic symptoms. Usually there is no pain and intermenstrual metrorrhage may simulate disorders of menstruation. However, intermenstrual hemorrhages are frequent, the uterus is of increased size, and the cervix is slightly opened. Diagnosis depends on biopsy findings. Young patients with endometrial cancer are in a general condition of hyperestrinism, which is the main cause of acute recurrent hemorrhages in cases of single or multiple myoma or of recurrent polyposis.

Semaine des Hôpitaux de Paris

28:123-164 (Jan. 14) 1952. **Partial Index**

*Hyperostosis Frontalis Interna in Man; Syndrome of Internal Frontal Hyperostosis and Testicular Atrophy. J. Warter and R. Moïse.—p. 123.
Effect of Infiltration of Vagus Nerve on Biliary Colic. J. Warter, J. M. Rouillard and J. Morin.—p. 127.
Nucleic Acids of Leukocytes. P. Mandel and P. Métais.—p. 129.

Hyperostosis Frontalis Interna in Man.—The occurrence of hyperostosis frontalis interna is reported in a 39-year-old man with asthenia and atrophic myotonia. Tendon and periosteal reflexes were abolished. For years the patient had persistent frontal headache nearly every day. His basal metabolic rate was -19%, and he had bilateral testicular atrophy. Roentgenologic examination of the skull revealed hyperostosis frontalis interna. Determinations of 17-ketosteroids in the urine revealed a considerable decrease in urinary androgens. The phenol steroids eliminated in the urine were near normal, but the patient had been treated for a prolonged period with testosterone propionate. Two injections of 50 mg. of this drug were given every week and 5 mg. of methyl testosterone was given orally daily for 10 months. The muscular condition improved considerably, but the hyperostosis frontalis interna was unchanged. The right patellar reflex was restored to normal after 6 months of treatment and remained normal after 10 months of treatment. The authors believe that testicular atrophy with the subsequent alteration of the androgen/estrogen ratio is responsible for the calvarial hyperostosis. It seems necessary therefore to study the roentgenographic appearance of the skull in all cases of male hypogenitalism. With regard to the favorable effect of the testosterone therapy on the patient's muscles, the authors recall the influence of androgens on the striated muscles, and they speculate that hyperostosis frontalis interna may occur in all primary diseases of the muscular system. Roentgenographic examination of the skull, therefore, is advisable in all such cases, particularly in Steinert's disease.

Tubercle, London

33:1-32 (Jan.) 1952

Rehabilitation and Resettlement. J. E. Geddes.—p. 2.
Clothing Shadows in Mass Radiography. R. Stalker.—p. 9.
Effects of Pregnancy on Pulmonary Tuberculosis. G. Beven.—p. 13.
Radiography and Tuberculosis: Selective and Mass Methods. H. J. Trenchard and R. Grenville-Mathers.—p. 20.
Sarcoidosis of Spleen and Bone-Marrow. A. Piney and M. S. Ross.—p. 24.

Zeitschrift für Immunitätsforschung, Jena

109:97-192 (Jan. 3) 1952. **Partial Index**

Specificity and Mode of Action of Bacteriophages. H. Billaudele.—p. 103.
Action of Splanchnic Stimulation on Bactericidal Effect of Serum. L. Goreczky, G. Ludány, J. Tóth and J. Vajda.—p. 118.
Behavior of Complete and Incomplete Agglutinins in Course of Immunization of Rabbits with Human Serum. K. Hummel.—p. 124.
*Significance of Rhesus Subgroups in Transfusion Reactions. H. J. Pettenkofer.—p. 144.
Studies on European Q-Fever Antigens. K. Herzberg and H. Urbach.—p. 159.

Rh Subgroups as Cause of Transfusion Complications.—In the typing of blood transfusion donors and recipients only the classical ABO system with subgroups and the Rh factor are considered, and the Rh subgroups are disregarded. It is assumed that only factor D (Rh_0) has antigenic characteristics so pronounced that disregarding it would lead to complications. Moreover the test serums that would be necessary for the determination of the Rh subgroups are not available. Pettenkofer cites an example that demonstrates the importance of Rh subgroups as cause of transfusion reactions. He demands that blood transfusion centers examine at least all Rh-negative donors for their Rh subgroups. Rh negative donors with the subgroup Cde, cdE, and CdE should not be accepted as donors.

Zeitschrift für Krebsforschung, Munich

57:577-684 (No. 6) 1951. **Partial Index**

Histologic and Cytologic Investigations on Fibroepitheliomas of Urinary Bladder. K. Kloos and J. Steffen.—p. 577.
*Use of Nitrogen Mustard in Recurrent Cervical and Mammary Carcinomas and in Metastatic Tumors of Bones and Lungs. F. Remold and A. Siegert.—p. 614.
Action of Folic Acid Antagonists and of Guanazola on Behavior of Tumors. C. Dittmar.—p. 621.
Action of Teropterin and Aminopterin on Human Bone Marrow in Vitro. I. Boll and H. Schlag.—p. 643.
Porphyrins and Cancer: Porphyrin Content of Malignant Tumors in Human Subjects. K. Bingold, W. Stich and H. Cramer.—p. 653.
Relations Between Lymphogranulomatosis and Reticulum Cell Sarcoma: Studies on Tissue Cultures. K. Werner, C. Landschütz and G.-A. Kausche.—p. 672.

Nitrogen Mustard in Recurrent and Metastatic Tumors.—The aim of these studies was to ascertain the mode of action and the therapeutic effect of nitrogen mustard in the treatment of recurrent cervical or mammary carcinomas and of metastatic bone and pulmonary tumors. The following factors served as criteria: the patient's subjective feeling; the objective status as determined by palpation, auscultation and roentgen examination; the general condition, as manifested by body weight and blood picture and finally the further course of the disease. Particular attention was given to the blood picture during and after treatment. The authors used the "tris" nitrogen mustard and, after commenting on the different dosage schemes that have been used, they say that they used Heilmeyer's method, in which 0.05 mg. per kilogram of body weight is administered every second day. A total of 38 patients were treated. Secondary effects in the form of malaise, nausea, loss of appetite, and vomiting as a rule were noted only after the third or fifth injection. It was found that the treatment with nitrogen mustard produced neither subjective nor objective improvement, but rather a definite and largely irreversible deterioration of the hematopoietic function and impairment of the patient's general condition with accelerated decline. The authors feel that treatment with the nitrogen mustards is inadvisable and unjustified.

Zeitschrift für Orthopädie, Stuttgart

81:209-376 (No. 2) 1951. **Partial Index**

Experiences in Operations on the Knee Joint, Particularly in Internal Injuries of the Knee. K. Niederecker.—p. 225.
*Tuberculous Humpback. W. Schosserer.—p. 250.
The Varicose Syndrome. H. Storck.—p. 259.
Technique of Operation for Syndactylism. W. Pacher.—p. 269.
*Operative Treatment of Perthes' Disease by Means of Drilling and Bolting. A. Stupnicki.—p. 272.
Modern Anesthetic Methods and Treatment of Shock in the Course of Orthopedic Operations. G. Glogowski.—p. 281.
Intrapelvic Protrusions of the Floor of the Acetabulum in Adults, with Particular Consideration of Arthrokatadysis. G. Imhäuser.—p. 311.

Tuberculous Kyphosis.—According to Schosserer, tuberculous processes in the vertebral column are usually accompanied by hump (gibbus) formation. This is due to the fact that in tuberculosis of the vertebral bodies, the anterior portions are usually more severely destroyed and collapse. The hump becomes greater as more vertebrae become involved in the destructive process. Furthermore, after the tuberculous process becomes arrested, resorption sets in, which removes the dead tissue, and may enlarge a gibbus that in the beginning was hardly preceptible. In cases in which destruction is uniform throughout the body of the vertebra, collapse takes place in the axial direction. These cases are usually comparatively benign and blocking usually follows soon. After briefly commenting on the prevention and treatment of gibbosity, the author says that observations on a large number of patients with spondylitis and gibbus formation reveal that there are three different forms, depending on whether the cervical, upper thoracic, or lower thoracic portion of the vertebral column is involved in the tuberculous process. Sketches clarify these forms, and it is pointed out that in patients with cervical spondylitis the skull generally is lengthened in the direction of the line drawn from the apex of the lambdoid suture to the chin. This is illustrated by profile photographs. It is also suggested that there is a relationship between the location of the gibbus and the temperamental characteristics of the patients in that gibbus in the cervical region is usually found in patients of the schizothymic type and asthenic build, who are intelligent, ambitious, and tend to be extreme in their attitudes. A cycloid temperament and a pyknic build are usually observed in those whose gibbus is located lower down.

Drilling and Bolting in Treatment of Perthes' Disease.—After a short discussion of the nature and the conservative treatment of Perthes' disease, Stupnicki presents five cases in which drilling and bolting of the head and neck of the femur were employed. This method produced favorable results in all five cases, and the author agrees with Schäffer and Zanoli that this method requires a much shorter time than conservative treatment. However, the operation does not always prevent the mushroom-like spreading of the head and neck of the femur.

BOOK REVIEWS

Antibiotic Therapy. By Henry Welch, Ph.D., Director, Division of Antibiotics, Food and Drug Administration, Federal Security Agency of United States Government, and Charles N. Lewis, M.D., Medical Officer, Division of Antibiotics, Food and Drug Administration. Foreword by Chester S. Keefer, M.D., Wade Professor of Medicine, Boston University School of Medicine, Boston. Cloth. $10. Pp. 562, with illustrations. Arundel Press, Inc., P. O. Box 2606, Washington 13, D. C., 1951.

This book is designed to provide the busy practitioner with a ready reference to antibiotic therapy. The first chapter is devoted to a broad historic survey, and the next eight chapters are devoted to discussion of antimicrobial activity, pharmacology, and dosage forms of the most widely used antibiotics. In the concluding 11 chapters, the use of antibiotics, in specific diseases, is discussed. Each chapter contains a selected series of references. Throughout the text, there are portraits of a number of pioneers in the field of antibiotic research and development and many full-page graphs. For the most part, these graphs are helpful additions to the text, but, in some instances, they are not as clear as they might be, because of incomplete or inaccurate labeling or inadequate coverage in the text. This is particularly true of the charts showing the relative sensitivity of microorganisms to various antibiotics and the nomograms relating dosage to body weight. Although no book can be completely up-to-date in this rapidly developing field, this volume contains a wealth of practical clinical information that is discussed in a clear, concise manner.

Man and His Years: An Account of the First National Conference on Aging. Sponsored by Federal Security Agency. Cloth. Pp. 311. Health Publications Institute, Inc., 216 N. Dawson St., Raleigh, N. C., 1951.

This book, divided into 13 chapters, reviews the various subjects discussed at the First National Conference on Aging and the conclusions reached and the recommendations made by each group of the Conference. The 14th chapter, entitled "Next Steps," outlines the proposed implementation of the recommendations resulting from the conference. The book covers the aging population, population changes and economic implications, income maintenance, employment, employability, and rehabilitation, health maintenance and rehabilitation, education, family life, living arrangements and housing, creative and recreational activities, religious programs and services, professional personnel, research on aging, and community organization. It will probably have only a limited place as a reference work for social and welfare workers; but other than this, it is useful for no other purpose. One does not get absorbed in the book; it is somewhat difficult to read, and most, if not all the subjects, have been previously discussed, debated, and written about.

The Effect of Hormones upon the Testis and Accessory Sex Organs. By Norris J. Heckel, A.B., M.D., Clinical Professor of Urology, Department of Surgery, University of Illinois College of Medicine, Chicago. Publication number 110, American Lecture Series, monograph in American Lectures in Endocrinology. Edited by Willard O. Thompson, Clinical Professor of Medicine, University of Illinois College of Medicine, Chicago. Cloth. $2.25. Pp. 73, with 21 illustrations. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill.; Blackwell Scientific Publications, Ltd., 49 Broad St., Oxford, England; Ryerson Press, 299 Queen St., W., Toronto, 2B, 1951.

This small volume contains an excellent review of the subject. It is well written and concise and should answer many of the questions that have arisen from recent experimental work on the male hormone and its actions on the sexual organs. From the practicing physician's standpoint, however, it suffers in its briefness, since there is a scarcity of clinical details and information regarding tests and diagnostic procedures. Because of the excellence, however, of the discussion on the basic physiological relationships of the male hormone to accessory sex organs, this may not be too serious an objection, since the reader can then consult the bibliography for more abundant and detailed information.

Cancer of the Esophagus and the Stomach. By Owen H. Wangensteen, M.D., Professor of Surgery, and Head, Department of Surgery, University of Minnesota Medical School, Minneapolis. Monograph for physician. Sixth of series on early recognition of cancer. Paper. Pp. 112, with 58 illustrations. American Cancer Society, Inc., 47 Beaver St., New York 4, 1951.

This monograph is a condensation of current knowledge of cancer of the esophagus and stomach. The personnel of the University of Minnesota library and members of the staff of the American Cancer Society contributed to its preparation.

From the literature concerning cancer of the upper portion of the digestive tract, the significant highlights have been extracted and arranged in logical sequence. Comment on the silent interval in cancer is followed by a consideration of cancer of the esophagus. The various possible lesions that confuse the picture are discussed in a chapter on diagnosis. Finally, illustrative case histories are given. This is followed by a discussion of the various surgical procedures that advancing science of surgery has evolved. Cancer of the stomach is discussed in the same manner. Consideration is given to pathology and precursors of gastric cancer. Under diagnosis, roentgenographic examination is recommended as the most reliable method available in the detection of early lesions. No mention is made of cytological studies of gastric washings as a possible aid in early diagnosis.

The monograph is generously sprinkled with illustrations in black and white and also color plates; charts, diagrams, and tables are effectively utilized. This monograph is an important contribution. In readable and concise fashion, it outlines the facts that have been proved in the search for a clearer identification of cancer of the esophagus and stomach. The spirit of the work is hopeful. It is recommended to practicing physicians as well as specialists. Only by intensifying the search for the early lesion and prompt resort to adequate therapy can the destructive malignant growths in the upper portion of the digestive tract be eliminated.

Perspectives in Human Malnutrition: A Contribution to the Biology of Disease from a Clinical and Pathological Study of Chronic Malnutrition and Pellagra in the African. By Joseph Gillman, D.Sc., M.B., B.Ch., and Theodore Gillman, M.Sc., M.B., B.Ch. Cloth. $18. Pp. 584, with 259 illustrations. Grune & Stratton, Inc., 381 Fourth Ave., New York 16, 1951.

This book has been written with three objects in view. The first object is to focus attention on the changing patterns of the clinical and pathological manifestations of chronic malnutrition and of pellagra in the native Johannesburg African, at various periods of his life. The second object is to assess the clinical and pathological findings at different stages of the syndrome in terms of modifications in physiological regulations. The third object is to examine the possibility entertained by us that chronic malnutrition, apart from being casually related to specific nutritional syndromes, affects the life tract of persons in such a way as to facilitate the emergence of some diseases, not usually regarded as etiologically related to nutrition, while excluding others. In their studies, a sharp distinction is made between chronic malnutrition and the acute episodes observed in chronically malnourished persons. Their experience has repeatedly demonstrated that some adults and many infants, admitted to a hospital, suffering from an acute episode of malnutrition, remained unresponsive and frequently died when treated by methods recommended for combating chronic malnutrition.

The perspectives in malnutrition suggest the necessity of shifting of emphasis in the study of disease from organs and tissues to physiological regulations and developmental processes. The effects of malnutrition can not be expected to always show themselves in the same way at all stages along the life track of a highly dynamic, rapidly evolving biologic system. Viewed in these perspectives, many diseases not hitherto regarded as etiologically related to nutrition or the environment become manifestations of a perverted development resulting from the peculiar metabolic momenta induced by the diet and by the physical and social environments.

The reviews here published have been prepared by competent authorities and do not represent the opinions of any official bodies unless specifically stated.

As an example, the authors suggest that impairment of growth can not be regarded as arising from a primary lack of growth promoting hormones, but the secretion of growth promoting hormones is suppressed when the diet is qualitatively defective or quantitatively inadequate. The authors have provided evidence that suggests that, among a population malnourished for one or two generations, the adults already harbor such extensive lesions in many organs that chances for cure are, at present, remote; however, a substantial improvement in the diet of young women and pregnant mothers will probably minimize the effects of an adverse maternal metabolism on their offspring.

The science of nutrition is still in its infancy. Science has still not disclosed the diet most suitable for protecting man against cardiovascular degeneration, carcinoma, and other diseases. Man is still ignorant about the principles of nutrition. Unless this ignorance is accepted and recognized with frankness and humility, it will merely be a case of the blind leading the lame, as far as feeding a malnourished nation is concerned.

Good food is essential for the well-being and happiness of mankind. There is scarcely any other known stimulus capable of provoking, silently and insidiously, so much chronic ill health as a monotonous and inferior diet. There is scarcely any other way whereby it is possible, wittingly or unwittingly, to inflict, at once, such widespread bodily harm on so many persons as tampering incorrectly with the diet of a nation.

As part of a contribution to the wide problem of malnutrition, Gillman and Gillman have set forth, in book form, their experiences with malnutrition in the Johannesburg native African. This should be provocative reading to anyone interested in the field of nutrition.

Surgical Practice of the Lahey Clinic. By Members of Staff of Lahey Clinic, Boston. Cloth. $15. Pp. 1014, with 784 illustrations. W. B. Saunders Company, 218 W. Washington Sq., Philadelphia 5; 7 Grape St., Shaftesbury Ave., London, W.C.2, 1951.

The book contains much information and can be recommended to anyone interested in surgery. It contains frank and authoritative discussions on many accepted and moot procedures. The contents discussed are: thyroid gland and neck; esophagus, lungs, and heart; stomach and duodenum; small intestine, colon, sigmoid, and rectum; biliary tract; spleen, adrenal gland, and pancreas; breast; pelvis; bones and joints; brain, spinal cord, and nerves; and anesthesia.

In the section dealing with subtotal thyroidectomy, there is the description of the operation originally described by Lahey, which has given him excellent results. Figure 16 on page 29 reveals platysma muscle being present in the midline. Since the platysma is deficient in this position, it would have been well to have shown this structure laterally rather than directly in the center. The section pertaining to tracheotomy after thyroidectomy is timely and well done. On the last line of page 132, dealing with tumors of the neck, the author refers to thyroglossal cysts when he means to say branchial cysts.

A total of 330 esophageal diverticula were operated on, with a mortality rate of 0.6% (two fatalities). All of these operations were done in two stages. The enthusiasm for this procedure can be gathered from the author's statement "we will continue indefinitely to employ the two stage rather than the one stage procedure." Total gastrectomy is being done in an increasing number of patients with cancer of the stomach, particularly those patients with cases in the earlier stages. A warning is sounded, however, that marked discrimination be used in the selection of patients for total gastrectomy. It is interesting to note the following statement: "In our hands, the percentage of two stage operations for carcinoma of the colon has steadily decreased in recent years." An increased number of patients with malignant disease of the large bowel were submitted to resection and primary anastomosis.

The section on the spleen is well written and informative. Figure 294 on page 535, however, presents the anatomy of the splenic artery and vein in an inaccurate fashion. In the majority of persons, the splenic vein runs behind the pancreas and not at its upper border as herein depicted. Furthermore, the splenic artery is the only branch of the celiac axis that takes a serpiginous course closely hugging the upper border of the pancreas. In this illustration, it is shown passing far above the pancreas and assuming a straight and vertical path. It is felt that carcinoma of the ampulla may be cured by pancreatoduodenal resection, but carcinoma of the head of the pancreas cannot. Total pancreatectomy, therefore, is thought to be a more logical procedure for this latter condition. The sections on partial lung resection and intracranial aneurysms were particularly well written.

Kreislaufuntersuchungen am Menschen mit fortlaufend registrierenden Methoden. Von K. Matthes, o. Professor für innere Medizin, Erlangen. Cloth. 48 marks. Pp. 326, with 205 illustrations. Georg Thieme, Diemershaldenstrasse 47, (14a) Stuttgart O; agents for U. S. A., Grune & Stratton, Inc., 381 Fourth Ave., New York 16, 1951.

This long monograph, in essence, brings together much previously reported work by the author; it is amplified by unpublished data and a review of some of the pertinent literature. Dr. Matthes, who is professor of medicine at Erlangen, describes his photoelectric extravascular methods for continuous and simultaneous recording of blood pressure, pulse rate, plethysmography, and blood oxygen saturation, in addition to respiratory excursions, skin temperature, and venous pressure. These methods were used in a series of investigations dealing with human respiratory and cardiovascular physiology under various conditions. The chapters deal with arterial oxygen saturation, oxygen saturation and vascular reactions during artificial arterial occlusion, pulse volume, rhythmic changes of blood pressure and pulse frequency, vasomotor reflexes, hyperventilation and carbon dioxide breathing, hypoxia, circulatory reactions to various drugs, such as sympathomimetics, hypertensive and hypotensive substances, atropine, and digitalis preparations.

Although containing few unexpected or startling results, this book may be of interest to those doing work in cardiovascular and aviation physiology. It will hardly appeal to the medical practitioner, except, rarely, as a source reference. It is unfortunate, and certainly detracts from the value of the book, that the many important physiological data recently gathered by means of human cardiac and aortic catheterization are hardly considered. The author states in the foreword that foreign publications have been taken into account "wherever possible." Much of the relevant postwar literature has reached Germany and should have been given more adequate representation in a book published in 1951. The format is good, and there are many illustrations. Since so many individual experiments are described or quoted in great detail, summaries at the end of each section would have been helpful.

General Medical Care Programs in Local Health Departments: A Report to the Subcommittee on Medical Care, Committee on Administrative Practice, American Public Health Association. By Milton Terris, M.D. and Nathan A. Kramer. Paper. 50 cents. Pp. 129. American Public Health Association, 1790 Broadway, New York 19, 1951.

This is one of several studies prepared by the staff of the Subcommittee on Medical Care of the Committee on Administrative Practice of the American Public Health Association. For the purpose of this study, the authors have undertaken to describe the medical services provided by local health departments for welfare recipients and the medically indigent.

As a preliminary step, the subcommittee addressed a questionnaire to every full-time local health department in the United States. On the basis of this questionnaire and supplementary data from state health officers, a list of 62 local health departments administering general medical care programs was compiled. This list represents approximately 5% of all full-time health departments; the only geographic concentration of this health department function is in Maryland, where all 23 counties are a part of a state-wide program. The remaining 39 counties and cities are located in 20 states and the District of Columbia.

The description of each program is brief, but it can be compared with all other descriptions. Characteristics are tabulated according to the following factors: origin and development, eligible population, services and personnel, volume of services, costs, and administration.

Except for the Maryland counties, most of the medical service programs administered by local health departments are centered around health department clinics or hospital clinics, where physicians' services, laboratory services, and drugs are readily available. The majority of these 39 programs provide for home care only in emergencies, and the care is generally given by full or part-time city and county physicians. On the other hand, all but two of the Maryland county programs are centered about the offices of private physicians with home and office care.

It is evident from a review of the descriptions that there is little uniformity among these general medical care programs administered by health departments. The authors believe, however, that "health officers in several localities have made real contributions toward improving the services provided" and "have demonstrated that effective medical care administration is not merely a matter of paying for service but requires careful attention to the proper organization of personnel, facilities and services as the key to achieving high standards."

They definitely lean toward the type of program centered about a teaching hospital or medical school, where, it is assumed, more emphasis will be placed on the quality of service and on the prevention of disease. As in much of the present day literature, the individual practitioner is given a back hand slap by emphasizing "medical care administration" and "team approach" as opposed to "patient-physician relationship." There is, however, little doubt that some of the experiments in coordinating therapeutic services with preventive medicine will have influence on future programs in this field and that they represent an improvement over the types of programs generally in operation today.

The subcommittee is convinced that administration of public medical care programs can be entrusted to local health departments and that a number of the experiments described in the report lend substantial support to this conviction. This, and semilar expressions by the subcommittee, are more important than the descriptions of the plans themselves. The functions of local health departments generally accepted in the past, vital statistics, sanitation, communicable disease control, laboratory services, maternal and child health, and health education, are being expanded to include a variety of other services, including therapeutic services. This study supports this expansion into a specific field and points the way to possible future developments. Its full implications are not obvious in the reading. Their recognition requires a look to the past and a guess as to the future.

Aphorisms of Dr. Charles Horace Mayo, 1865-1939, and Dr. William James Mayo, 1861-1939. Collected by Fredrick A. Willius, M.D. Cloth. $2.75. Pp. 109. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill.; Blackwell Scientific Publications, Ltd., 49 Broad St., Oxford, England; Ryerson Press, 299 Queen St., W., Toronto 2B, 1951.

This small book contains 215 quotations culled from the complete writings of two great American surgeons, Drs. Charles and William Mayo; it also includes the so-called lost oration, in which Dr. William Mayo expressed the ideals of him and his brother before a Committee of the Minnesota State Legislature, in 1917.

Mayo thinking on a variety of medical, sociologic, and economic topics is exemplified by the following quotation. "Carry out the two fundamental surgical requirements: see what you are doing and leave a dry field." "When you want support for public health measures you have to educate the people. When you start to educate the people you should begin with the women because they will fight for the health of their children." "More good would come to our country through tongue control than birth control." "It is a man's duty to provide moderately for his family, but anything beyond this may be a detriment to his descendents." "The keen clinician, as he grows in experience, becomes more and more valuable as age advances."

Pediatric Allergy. By Robert Chobot, M.D., Assistant Clinical Professor of Pediatrics, New York University-Bellevue Medical Center, New York. Cloth. $4.50. Pp. 284, with illustrations. McGraw-Hill Book Company, Inc., 330 W. 42d St., New York 18; Aldwych House, Aldwych, London, W.C.2, 1951.

This volume is an abbreviated text on general allergy. The title and the inference in the preface that the book is specially adapted to pediatric problems are not borne out by the contents. Although the conventional subjects of textbooks on allergy are discussed, the author takes an unconventional stand on the role of infection. He advocates frequent removal of tonsils and adenoids in treatment of asthma and infantile eczema. Although much of the material is sound and conservative, dogmatism and loose statements are fairly common. On page 80, for example, it is stated, "clinical experience has proved the method (leukopenic index) to be inadequate, and it is no longer used in diagnosis," but the fact remains that certain persons still use it. On page 117, the author states, ". . . one thing we can be sure of is that with specific therapy pollen asthma can be prevented. . . ." Such therapy is often effective for pollen asthma, but one cannot be sure of it. On page 170, the author, in classifying horse serum reactions, mentions the naturally occurring type as occurring "when an allergic patient who is born spontaneously sensitive to horse serum. . . ." This is stated as an accepted fact, whereas evidence and acceptance point to the opposite opinion. There are many typographic errors and incorrect statements. Pages selected at random may serve as examples: on page 1, there are five, and on page 45, there are two errors. This book may be useful to anyone who is interested in a brief general coverage of the field of allergy, along with some unusual approaches.

Textbook of Psychiatry. By Eugen Paul Bleuler. Authorized English edition by A. A. Brill. With biographical sketch by Jacob Shatzky, Ph.D., Psychiatric Research Librarian, New York State Psychiatric Institute, New York. [Second edition.] Cloth. $7.50. Pp. 635, with 51 illustrations. Dover Publications, Inc., 1780 Broadway, New York 19, 1951.

This book, translated from the fourth German edition, is primarily a textbook for students and general practitioners, covering the general field of psychiatry.

The book is written from the viewpoint of psychodynamic psychiatry, the author having been one of the first well-known psychiatrists to apply the teachings of Freud. This volume stresses the need for a thorough understanding of normal psychology and general psychopathology, in order to provide a comprehensive basis for an understanding of the separate psychiatric entities.

In his consideration of the individual mental disorders, the author tends to follow the descriptive Kraepelinian classification. This differs considerably from the classification of mental disease, recently developed by the American Psychiatric Association, which appears in the fourth edition of "Standard Nomenclature of Diseases and Operations." The latter classification places greater stress on the functional aspects of diagnoses in mental disease.

This book is valuable to the student as an introduction to the basic thought underlying modern psychodynamic psychiatry. Much that has developed in recent years, in this field, has not been included; nevertheless, the clarity of expression, particularly in the chapters on psychology and the discussions of the basic factors and patterns underlying mental disorders, are still pertinent. The book is well illustrated. It includes a selected bibliography of Bleuler's original writings and a short biography of the author.

Arthritis: What You Can Do About It. By Robert D. Potter. Cloth. $2.75. Pp. 239. Dodd, Mead & Company, Inc., 432 Fourth Ave., New York 16, 1951.

The author's purpose in writing this book is to "tell the story of arthritis, and the story behind the story"—to tell what was done in advancing knowledge concerning the rheumatic diseases and to explain what these developments mean to the victims of arthritis and rheumatism. The book is written for the layman, the victim or the potential victim of rheumatism. Among the author's objectives are: (1) to give the rheumatoid arthritic patient hope and encouragement, which is provided by the development of cortisone and corticotropin, (2) to teach the sufferer from rheumatism to know more about this group of diseases in order to be better able to manage his problem, and (3) to eliminate superstition and unwarranted use of worthless nostrums. The subject matter, which ordinarily holds little interest for the layman, is so cleverly treated that the reader is kept keenly interested.

This book is based on reports of advances in the field of arthritis and rheumatism, made at the seventh International Congress on Rheumatic Diseases, held in New York City, in June, 1949. Although not encompassing all aspects of the rheumatic disease, the wide scope of the book is shown by the various chapters, which deal with the following subjects: (1) types of arthritic patients and types of arthritis, (2) role of cortisone and corticotropin (ACTH) in arthritis, (3) control of rheumatic fever, (4) psychogenic factors in rheumatism, (5) effects of climate on rheumatic diseases, (6) nonarticular rheumatism, (7) value of physical treatment, (8) orthopedic surgical procedures, and (9) problems of synthesis of cortisone.

The format is conventional, and the type is pleasing to read. The author's style is appealing to the layman; the scientific subject matter is discussed in simple language, without scientific terminology. The chapter titles are clever and interesting. The subjects are dealt with in an intimate fashion, for the author has thorough knowledge of the facts and many of the investigators. There are no illustrations and no bibliography (this is not a text), but the facts have been carefully checked for accuracy by leading physicians in the field of rheumatology. This book is clearly the most reliable, up-to-date source of information about rheumatic diseases for the layman. It is written in an interesting manner and should be recommended to all patients who have rheumatism. Physicians, too, will find this monograph interesting and informative.

Pratique obstétricale. Par B. Jamain. Préface du professeur agrégé Jean Ravina. Paper. Pp. 200. L'Expansion scientifique française, 23 rue du Cherche Midi, Paris, 6e, 1951.

This little book is very clearly written in simple French. It is short and concise. Its size precludes extensive discussions and the covering of controversial subjects.

In general, one can agree with the recommendations for the management of complicated obstetric cases presented by the author and with his clinical observation in various conditions. On the other hand, the reviewer cannot agree fully with all of the recommendations for management, such as when the author advises the Simpson method of manual removal of the placenta before delivery of the baby in placenta previa and also when he speaks of the necessity for doing a high or classical cesarean section instead of a low cervical cesarean in placenta previa. The blood pressure is not always elevated in eclampsia; some of the most serious cases may have a low blood pressure. In the treatment of hyperemesis gravidarum, the possible seriousness of the condition is clearly pointed out, but no recommendation is made for the care of those patients that do not respond to medical management. The importance of avitaminosis is not sufficiently stressed in the management, and no mention is made of the interrelationship between hyperthyroidism and pernicious vomiting and the benefit to be derived from iodine in a selected group of these cases. In his discussion of vaginal cesarean section, under indications, he fails to mention the fact that infection, present or potential, may help to indicate the delivery by this method, and, under the technique of this procedure, he does not mention the desirability of cutting the posterior as well as the anterior lip of the cervix and low uterine segment in delivering larger babies. The discussion of appendicitis fails to take into account the displacement of the appendix upward by the pregnant uterus in the later months, which we feel is an important point to be considered. The repair of the third degree tear, as discussed by the author, is somewhat different from the technique advised in other clinics of this country. Usually, American surgeons use his technique in closing the mucosa and sphincter and then use a figure 8 silkworm-gut to close levators and urogenital septum and skin over the rectum. They also put the patient on a liquid diet and give opium to prevent bowel movement occurring for 10 days after such repair, as they believe it reduces the incidence of rectovaginal fistula.

The paper binding of the book is not suitable and will rapidly disintegrate with much using. It is useful to read the author's point of view on these subjects.

Physical Medicine and Rehabilitation for the Clinician. Edited by Frank H. Krusen, M.D. Cloth. $6.50. Pp. 371, with 96 illustrations. W. B. Saunders Company, 218 W. Washington Sq., Philadelphia 5; 7 Grape St., Shaftesbury Ave., London, W.C.2, 1951.

The editor of this textbook has combined in its 39 chapters articles by himself and 24 other contributors. It is indicated in the preface that the book was "designed especially to acquaint the average clinician with all the phases of this rapidly developing new special branch of medicine which would be useful to him in practice." It accomplishes the purpose for which it was designed in an excellent manner. This book will not only be of interest to the average clinician but will be of special benefit to the physiatrist, because it presents discussion of the latest developments in the field of physical medicine and rehabilitation. The first section, entitled "Therapeutic Application of Physical Agents and Procedures," contains chapters on prescription writing in physical medicine, uses of heat, massage, basic principles used in therapeutic exercise, factors involved in posture, training the patient to rest and relax, and occupational therapy. This first section also contains excellent chapters on ultrasonic and experimental studies in microwave diathermy. The chapter on ultrasonics does not advocate the therapeutic use of ultrasound. It does point out some of the basic problems concerned with the use of this agent and thus briefly advises the reader of its hazards and potential usefulness. The second section, entitled "Diagnostic Applications of Physical Agents and Procedures," contains four chapters, which present electrodiagnostic methods, muscle testing procedures, skin resistance testing in neurological diagnosis, and measurements of the skin temperatures in health and disease. A third section devotes a number of chapters to subjects such as physical medicine and rehabilitation in a general hospital, function of the medical social worker, physical medicine in relation to neurology, arthritis, psychosomatic problems, orthopedic problems, poliomyelitis, and cerebral palsy. A final section, entitled "Fundamentals of Anatomy, Therapeutic Exercise and Physiology as Related to Physical Medicine and Rehabilitation," presents valuable material on the anatomy of the limbs and trunk, as well as physiology and the physiological effects of rest and immobilization.

Although the chapters are not extensive reviews of the various subjects that they cover, they do present basic useful information. The text is well illustrated, and the format is attractive.

Physical Medicine and Rehabilitation for the Aged. *By* Walter S. McClellan, M.D., Medical Director, Saratoga Spa, Saratoga Springs, New York. Publication number 105, American Lecture Series, monograph in American Lectures in Physical Medicine. Edited by W. A. Selle, Ph.D., *Professor of Biophysics, University of California Medical Department, Los* Angeles. Cloth. $2. Pp. 81, with 9 illustrations. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill.; Blackwell Scientific Publications, Ltd., 49 Broad St., Oxford, England; Ryerson Press, 299 Queen St., W., Toronto, 2B, 1951.

As the field of physical medicine and rehabilitation grows, there is an increased need for books that discuss its applications in the various fields of medicine. This monograph relates clearly, yet briefly, the usefulness of physical medicine and rehabilitation in the field of geriatrics. A two page chapter outlines the physiological changes in the aged that influence response to treatment. The next chapter briefly describes therapeutic physical agents, such as water, electricity, radiant energy, and mechanical force. It is unfortunate that, in the latter portion of this chapter, reference is made to the Zander apparatus, which has little therapeutic value for the younger patient and might result in frightening consequences if used on the aged. The chapter on application of physical medicine in specific medical conditions, describes the treatment of various forms of arthritis and related disorders in general terms. A section on spa therapy is included, with special reference to its advantages for patients with cardiovascular ailments. The purpose of this book is to summarize physical medicine and rehabilitation as it is related to the treatment of the aged, in a manner that would be interesting to the busy physician.

Social Medicine. By E. H. Cluver, K.St.J., E.D., M.D., Director, South African Institute for Medical Research, Johannesburg. Cloth. £3 5s. Pp. 862. Central News Agency, Ltd., Corner Rissik & Commissioner Sts., Johannesburg, S. Africa, 1951.

This textbook was written to fill a need for a separate work dealing with the influence of social factors on human health. The various parts of the book are written by South Africans who have special knowledge of the field under consideration. It deals extensively with all aspects of social medicine; these are causes of human disorganization, personal disorganization, social diseases, social disorganization, statistics, and medicosocial legislation.

The legislation and institutions in South Africa that deal with sociomedical problems are discussed in detail. A large portion of the book is directed to local South African problems; it is, therefore, of limited interest to American readers. Its broad scope and authentic content recommend it to the physician who is especially interested in social medicine.

QUERIES AND MINOR NOTES

EXPLANATION OF Rh, rh, Hr, AND hr

To the Editor:—*Please explain the use of Rh, rh, Hr, and hr. In the English classification, I noticed that capitalized letters are also used. I understand the rhesus factor in blood but would like a simple explanation of the terminology.*

M. T. Bolotin, M.D., Los Angeles.

Answer.—The serology and genetics of the Rh-Hr types are complex, and, inasmuch as terminology is merely a convenient means of presenting the facts regarding a subject, the nomenclature of Rh-Hr types is necessarily involved. The Rh-Hr types constitute a blood group system independent of the classic A-B-O groups and the M-N types. The blood factors of the system belong to two main categories, designated as the Rh and Hr factors. The Rh factors are of three principal varieties, designated as Rh$_0$, rh', and rh'', respectively. The Hr factors are related to the Rh factors serologically and genetically in the same way that the blood factor N is related to blood factor M. Of the three theoretically possible Hr factors, however, only two are really known to exist, namely, hr' and hr''. The symbol Rh$_0$ is written with a capital "R," while the other symbols have a small initial letter. The reason for this is that Rh$_0$ has a special position because it is the most antigenic factor in this system and is therefore the one usually at the basis of the clinical complications of hemolytic transfusion reactions and erythroblastosis fetalis. Factor Rh$_0$ also corresponds to the original rhesus factor discovered with the aid of immune serums prepared by injecting rhesus blood into experimental animals. At present, antiserums of human origin exclusively are used for Rh examinations because of their higher avidity and titer; besides, antiserums of specificities other than anti-Rh$_0$ are obtainable only from human sources.

By testing blood with the most important serum anti-Rh$_0$ alone, persons can be classified as Rh-positive or Rh-negative. (When the terms "Rh-positive" and "Rh-negative" are used without qualification what is really intended is "Rh$_0$-positive" and "Rh$_0$-negative," respectively.) This subdivision is adequate for most clinical purposes. When examining blood donors, however, it is desirable to carry out tests with serums anti-rh' and anti-rh'', and only those donors with cells lacking all three Rh factors should be used for Rh-negative recipients. Such persons are designated as type rh (or triple Rh negative) to distinguish them from Rh-negative persons who have been tested for the Rh$_0$ factor alone. With the aid of the three Rh antiserums, eight types of blood can be distinguished, namely, rh, rh', rh'', rh$_y$ (or rh'rh''), Rh$_0$, Rh$_1$ (or Rh'$_0$), Rh$_2$ (or Rh''$_0$), and Rh$_z$ (or Rh$_1$Rh$_2$). The first four types are Rh negative, and the absence of the Rh$_0$ factor is indicated by the small "r" in the symbol. The latter four types are Rh positive as indicated by the capital initial "R".

In heredity studies, it has been found that the factors Rh$_0$ and rh', when they occur together in a person, tend to remain together in his children, and the same is true of factors Rh$_0$ and rh''. Thus, in general, the blood factors Rh$_0$ and rh' are not parts of separate agglutinogens but of the same agglutinogen molecule. That is the reason for designating the antigenic complex Rh$_0$rh' by the short symbol Rh$_1$ (or Rh'$_0$), namely, to indicate that this is a single substance inherited as a unit; however, factor Rh$_0$ and rh' do occur occasionally in separate agglutinogens, and, in fact, among Negroids blood of type Rh$_0$ (that is, blood containing factor Rh$_0$, but not rh' or rh'') is the most common Rh-Hr type. To account for the hereditary transmission of the eight Rh types, it is necessary to postulate a series of at least eight allelic genes, namely, r, r', r'', r^y, R^0, R^1, R^2, and R^z, each determining a corresponding agglutinogen, rh, rh' rh'', rh$_y$, Rh$_0$, Rh$_1$, Rh$_2$, and Rh$_z$, respectively. The symbols used for genes and agglutinogens are distinctive, in that italics are used for the genes and the letter "h" is omitted; moreover, superscripts are used to qualify gene symbols and not subscripts, in order to conform with the practice of American geneticists. It will be recalled that the Rh and Hr factors are reciprocally related. Therefore, whenever an agglutinogen lacks an Rh factor it possesses the corresponding Hr factor; for example, agglutinogens rh and Rh$_0$ have both Hr factors, hr' and hr''; agglutinogens rh' and Rh$_1$ have the hr'' factor but not hr'; agglutinogens rh'' and Rh$_2$ have factor hr' but not factor hr'', while agglutinogens rh$_y$ and Rh$_z$ have no Hr factors.

Every person inherits one Rh gene from each of his parents, and the resulting pair of genes represent his Rh genotype. When examining a person's blood, therefore, we do not test for the product of a single gene but of a pair of genes. The effect of each individual gene is deduced by comparing the reactions of blood cells from different persons of selected genotypes. When tests are carried out with all five reagents, anti-Rh$_0$, -rh', -rh'', -hr', and -hr'', the situation becomes quite complex, because as many as 18 phenotypes are then recognizable corresponding to the 36 theoretically possible genotypes.

Table 1.—*Comparison of International and British Nomenclatures for the Rh-Hr Types*

Partial list of symbols*

International Nomenclature	British Notations	International Nomenclature	British Notations
Blood Factors		Antiserums	
Rh$_0$	D	Anti-Rh$_0$	Anti-D
rh'	C	Anti-rh'	Anti-C
rh''	E	Anti-rh''	Anti-E
hr'	c	Anti-hr'	Anti-c
hr''	e	Anti-hr''	Anti-e
Genes	"Chromosomes"	Agglutinogens	Agglutinogen Complexes
r	cde	rh	cde
r'	Cde	rh'	Cde
r''	cdE	rh''	cdE
r^y	CdE	rh$_y$	CdE
R^0	cDe	Rh$_0$	cDe
R^1	CDe	Rh$_1$	CDe
R^2	cDE	Rh$_2$	cDE
R^z	CDE	Rh$_z$	CDE
Genotypes		Phenotypes	
rr	cde/cde	rh	See table 2
$r'r$	Cde/cde	rh'rh	
$r'r'$	Cde/Cde	rh'rh'	
R^0r R^0R^0	cDe/cde cDe/cDe	Rh$_0$	
R^1r R^1R^0 R^0r'	CDe/cde CDe/cDe cDe/Cde	Rh$_1$rh	
etc.	etc.	etc.	

* List does not include the Rh variants.

Instead of postulating a series of multiple allelic genes determining corresponding complex agglutinogens, one might imagine that each of the blood factors, Rh$_0$, rh', and rh'', is inherited by a separate pair of genes and that these gene pairs are either in separate chromosomes or are linked within the same chromosome. In either event as a result of independent assortment or crossing-over, at equilibrium the distributions in the general population of the factors Rh$_0$, rh', and rh'' would become independent of one another. That is, the frequency of blood factor rh' should be the same among Rh$_0$-positive persons as among Rh$_0$-negative persons; however, factor rh' occurs almost invariably in association with Rh$_0$ and only rarely without Rh$_0$, and the same is true of factor rh''. This refutes the concept of separate gene pairs. Though the concept of separate gene pairs was disproved early in the history of the Rh-Hr types, it was later revived by the British investigators, who made it the basis of a different method of designating the Rh-Hr factors. This was indeed an unfortunate development. The British sym-

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The answers here published have been prepared by competent authorities. They do not, however, represent the opinions of any official bodies unless specifically stated in the reply. Anonymous communications and queries on postal cards cannot be answered. Every letter must contain the writer's name and address, but these will be omitted on request.

bols are not only based on incorrect genetic and serologic concepts but have led to an unnecessary and confusing duplication of nomenclature. Many articles have been written using the British notations, and a partial table of equivalents is given in table 1.

While the British C-D-E notations may appear easier to understand, this simplicity is deceptive and is based on a misconception. Actually these notations are misleading and are not at all informative. They merely state that there are three Rh factors and incorrectly imply that tests are being done routinely also for three corresponding Hr factors, whereas there is no antiserum available to test for the so-called little d (Hr$_0$) factor. Moreover, they do not show the special position of factor Rh$_0$, and there is nothing to indicate which types are Rh$_0$-positive and which are Rh$_0$-negative. While the symbols for the elementary blood factors are simple, the nomenclature becomes impossible to use when dealing with agglutinogens and phenotypes as is necessary in Rh-Hr typing. Thus the British workers have been compelled to use so-called shorthand symbols, which are merely minor variations of the international Rh-Hr nomenclature, and thus adopt the incongruous position of arguing that two nomenclatures are simpler to use than one. The C-D-E symbols are impossible to use orally, and no provision is made for phenotype designations with these symbols. Consequently, as an equivalent for the international symbol for phenotype Rh$_1$rh, for example, C-D-E workers have used as many as 20 or more cumbersome variations in their publications, of which a partial list is given in table 2.

TABLE 2.—*Comparison of International and British Symbols for Phenotypes*

International Rh-Hr Nomenclature	Corresponding British Notations	
	Designations	Comments
1. Rh$_1$rh	1. None	Space for phenotype designation is left blank in British tables
	2. +++— or ++—+ or C+D+E—c+, etc.	The symbols represent the reaction with the four most frequently used antisera, in various orders
	3. CcDee or CcDe or CcD	These designations were proposed in 1919 but have not been widely adopted
	4. $\frac{CDe}{cde}$, CDe/cde, or CDEcde	This is the most likely genotype
	5. CDe/cde CDe/cDe Cde/cDe	All possible genotypes are bracketed together
	6. CDe/cde (R$_1$r) or CDe/cde (Rh$_1$rh)	This is the most likely genotype together with "shorthand" or Rh-Hr designation for clarity
	7. R$_1$r R$_1$R$_0$ R$_0$r′	All possible genotypes are expressed in "shorthand" symbols and bracketed together
	8. R$_1$r	This is the "shorthand" symbol alone
	9. CDe/c, $\frac{CDe}{ce}$, CDece, etc.	Symbols d and e are omitted, in order to indicate that blood was not tested with anti-e (hr″) serum or hypothetical anti-d (Hr$_0$)
	10. DCe/dce	This is the most likely genotype with symbols arranged to correspond with postulated arrangement of the "genes" in the chromosome
	11. CD heterozygous	For oral use

Everyone agrees that eventually there will be only a single nomenclature for the Rh-Hr types, just as in the case of the A-B-O groups and M-N types. As soon as it is generally appreciated that the C-D-E notations, like the Moss-Jansky numberings for the A-B-O groups, serve merely to conceal ignorance and that the use of these notations discourages all desire to acquire a fundamental understanding of the subject, editors will insist on the exclusive use of the international Rh-Hr nomenclature in articles published in their journals. Such a step would do much to further a more widespread understanding of the subject and progress in the field.

To simplify the present discussion, no mention has been made here of the Rh variants. Those wishing to acquire a full understanding of the subject are urged particularly to study the excellent articles that have been published recently on blood groups in cattle and chickens by Stormont and Briles.

INVOLUTIONAL PSYCHOSIS AFTER OVARIECTOMY

TO THE EDITOR:—*A woman, 43, had an ovariectomy two months ago, and now, she wants to have her ovaries transplanted in order to restore her functions. She has three children; the youngest is 4 years old. The second child needed transfusions at birth for erythroblastosis, but the third child was normal at birth. The woman complains of "fear she will lose her mind," and "wants her ovaries put back in." She has been extremely depressed and looks somewhat myxedematous and dull. The surgeon gave her estrogens (premarin®), and 1 grain (0.06 gm.) of thyroid extract daily. Her blood pressure is 124/80, and her pulse rate is 80. There have been symptoms of palpitation, insomnia, melancholia, and pruritus vaginae. Pelvic examination reveals that the fundus uteri is missing, but part of the cervix remains. In my opinion, if the cervical remnant could be stimulated to menstruate this patient would benefit psychologically. If pellet implantation is of value, it too might be efficacious from the same standpoint. This patient's condition is suggestive of prepsychotic symptoms, and I would welcome suggestions regarding implantation of ovarian hormone pellets.* *M.D., California.*

ANSWER.—A fair conclusion from the submitted data is that this woman is suffering from a mild psychosis, possibly of the so-called involutional type and that her symptoms are not simply menopausal. She obviously has wrong ideas as to possibly losing her mind because her ovaries were removed and of the desirability of "wanting her ovaries put back in." Unless she is actually psychotic, it would seem that a physician could readily set her straight on such questions. No mention is made of vasomotor symptoms, so that there is no indication for estrogen therapy, especially as the symptoms that she shows appear to be psychogenic and not menopausal. Heterotransplantation of the ovaries is not successful, and it is not a recognized operation. Pellet implantation is not indicated and certainly would offer no advantage over the far more flexible plan of oral estrogen therapy, even if this were indicated. This woman is in greater need of psychiatric than hormone therapy.

ALLERGY AND RESPIRATORY TRACT INFECTIONS

TO THE EDITOR:—*In the middle of August, 1951, intense itching of the nose, roof of the mouth, and eyes, followed by watery nasal discharge and violent sneezing developed in a 29-year-old man. This condition was diagnosed as "hay fever due to ragweed pollen." There is no personal or family history of allergy; however, this was his first summer in this country. The antihistamines did not seem to help, and he was treated with pollen extract injections throughout the season without success. The cardinal symptoms disappeared with the onset of cooler weather at the end of September; however, an itching sensation of the roof of the mouth persisted, and one nostril was often obstructed. He has noted an increased susceptibility to colds and upper respiratory infections. Should he be treated with pollen extract throughout the year?*

M.D., New York.

ANSWER.—A first season's hay fever extending into nonseasonal symptoms almost always means the presence of additional allergy. It is assumed that the patient was actually found allergic to ragweed by test. The nonseasonal symptoms speak for an allergy, possibly to dust, feathers, or another inhalant. The allergic condition may decrease the resistance of the respiratory tract to infection; however, the question of the presence of infection here should be definitely established. If the spells come frequently and last a short time, or if there are many eosinophils in the nasal and bronchial secretions, and if the infection is not transmitted to other members of the family, the chances are they are not infectious in nature. At times, in long-established and severe seasonal hay fever, respiratory symptoms may occur in the winter, without being traceable to new allergies. They are produced by irritating influences, such as cold air, dry air, and exertion. In such cases, successful treatment for the seasonal hay fever may prevent these winter symptoms. Treatment with pollen extract at the present time will have no influence on the symptoms this winter. A complete allergic check-up is advisable, with future treatment based on the results of the findings.

"AIR DENT" METHOD OF GRINDING TEETH

To the Editor:—*I have had some patients who worked in dental offices, in which "air dent" methods of grinding teeth (applying abrasives with air pressure) have been used. These patients had respiratory infections, and they were concerned about the possibility of inhaling substances from air syringes. Is there any occupational hazard connected with the use of these syringes?*

Mavis P. Kelsey, M.D., Houston, Texas.

Answer.—This question centers about the exposures for the dental operator; however, the reply must concern the patient as well. In this innovation, the abrasive applied represents a mixture of aluminum oxide and dolomite, which is calcium carbonate. In practice, the size is from 10 to 50 μ. About 30 gm. are involved in the average excavation. This is thrust on the tooth area under air pressure of 80 to 90 lb. The process is dry, and exhaust apparatus is required to remove the dusty fines. At times a local anesthetic is required as is usual for all such excavation methods. The operator is thus exposed to the damaging properties of local anesthetics. The method is such that no severe damage is imposed on soft tissues, but some particle imbedment into the mucosa takes place, with spontaneous extrusion in about 24 hours. There is a possibility that the operator may be exposed, more than with other methods, to flying infective material surrounding dust particles. Although neither aluminum oxide or dolomite (an alkali) is rated as conducive to substantial pulmonary injury, a theoretical risk is involved. Much depends on the ability of the operator to successfully make use of the exhaust appliance. Cold associated with compressed air is said not to be detrimental. It is, perhaps, too early to make a definite statement concerning this problem. Extensive investigations on undesirable agents are now under way. The air dent method, however efficacious, is not receiving wide application, owing to the high cost of the equipment.

VIRAL DYSENTERY

To the Editor:—*A form of intestinal disturbance popularly called Saint Lawrence fever is prevalent in the Great Lakes basin and adjoining areas. Some doctors think that the term Saint Lawrence fever is merely a euphemism for various forms of food poisoning, because, when flies are eliminated and sanitation is improved, the incidence of the disease drops remarkably. Other doctors blame the water, paratyphoid and various organisms. Some health officials say the cause of Saint Lawrence fever is unknown. What is your opinion?*

Robert P. Little, M.D., Quebec, Canada.

Answer.—There is reason to believe that the intestinal disturbance in question is a malady to which many other names are given; some of the names are epidemic nausea, vomiting and diarrhea, gyppy tummy, trots, water disease, winter disease, summer disease, Hannover disease, Spencer's disease, and Reimann's disease, depending on the symptoms, when or where it occurs, and who describes it. The best general term is viral dysentery. Although a virus has not been identified, epidemiological, clinical, and experimental evidence point to one or more filtrable agents as the cause. The disease was transmitted to volunteers by the inhalation or ingestion of filtrates of diarrheal feces from patients. The disease is widely epidemic and even pandemic, especially in the late summer or autumn; epidemics last a month or more and, at times, account for more intestinal disturbances in this part of the world than any other enteric infection. Epidemiologically, viral dysentery resembles the common cold, and it is chiefly noted when households, schools, barracks, and other closed communities are affected. Because the symptoms are usually mild and brief, epidemics may escape detection. A common supply of food or water, though usually suspected, is not the source of the disease, and enteric bacteria play no role. Since the mode of transmission seems to be by contact or by the airborne route, the usual sanitary measures, although important under any circumstances, do not affect the incidence rate of viral dysentery. Therapy is seldom necessary and antibiotics should not be given. Bed rest is desirable, and parenteral infusion may be needed for the replacement of fluid lost by vomiting and diarrhea.

TRANSFUSION REACTION

To the Editor:—*A transfusion reaction occurred after the administration of 500 cc. of group O, Rh negative, banked blood to a group O, Rh negative recipient. The crossmatch was compatible at room temperature, 37.5 C, and at 4 C. The transfusion reaction was of the hemolytic type with hemoglobinuria, anuria for 48 to 72 hours, and complete recovery in a week. A postreaction check showed the transfused blood to be compatible with that of the patient in every respect. The patient was suffering from marked anemia and intestinal obstruction, as a result of an Ascaris lumbricoides block. The transfusion was administered simultaneously with a 5% solution of glucose in distilled water through different intravenous routes. An administration of 1,000 cc. of 5% solution of glucose in distilled water followed the transfusion. Is there danger of a hemolytic reaction in giving 5% or 10% solutions of glucose in distilled water through the same tubing that has been previously used for the administration of blood? Is there danger of a hemolytic reaction occurring from the use of a 5% or 10% solution of glucose in distilled water when given simultaneously with blood, although given by different intravenous routes? Is there any danger of a hemolytic reaction occurring when a transfusion is preceded or followed by a 5% to 10% solution of glucose in distilled water? If so, what is a safe time interval, and what precautions should be taken to prevent such reactions?*

M.D., Maryland.

Answer.—This consultant does not know of a case in which a transfusion reaction such as you describe was proved to result from intravascular mixing of a properly prepared 5% glucose solution and properly administered blood of normal osmotic fragility; however, hemolytic transfusion reactions have resulted from the entrance of distilled water into the circulatory system prior to blood transfusion. Moreover, it has been emphasized that 10% glucose and even 5% glucose are not isosmotic with stored blood, particularly when the blood is at a lower temperature than the glucose solution. Therefore, when large amounts of 5% or 10% glucose are mixed with banked blood, hemolysis sufficient to cause hemolytic transfusion reactions may occur. For this reason, large amounts of glucose solution at room temperature should not be permitted to mix with cold banked blood. If transfusions are started with glucose, care must be taken to prevent the glucose solution from backing up into the blood.

The use of Coombs' serum and trypsinated red cells in incompatibility tests and the employment of a simple test for osmotic fragility are newer techniques that may be helpful in explaining or preventing hemolytic transfusion reactions.

VISUAL REQUIREMENTS FOR DRIVERS

To the Editor:—*I received the following letter from the Driver Improvement Bureau of the Motor Vehicle Department of this state: "Your State of Delaware is endeavoring to lower the motor vehicle accident rate by attacking the problem from every possible point of view. One important phase of the investigation is concentrating on the visual fitness of the drivers licensed by this state. It is thought that the present visual requirements and testing should be revised. We would appreciate learning your views based on your specialized training in the field of ophthalmology. Please fill out the enclosed questionnaire and return at your earliest convenience." I am requesting your assistance in answering this letter.*

M.D., Delaware.

Answer.—Unfortunately, there are no authoritative standards for amount and quality of vision needed for safe driving. Indeed, there is no agreement on which functions of vision should be tested. Lebensohn (*Am. J. Ophth.* **32**:592, 1949) points out that the macular vision of the accident-prone driver does not differ from that of the ordinary driver. Deficiencies in dark adaptation, field of vision, and eye-hand and eye-foot coordination are more significant than central visual acuity. No state, as yet, tests drivers for night vision or glare resistance, although these factors are as important as central vision. Only three states require reexamination for renewal of licenses. Obviously, frequency of examination is paramount to the continued maintenance of adequate standards.

eral, hexamethonium bromide injections have been given during observation in a hospital. Only a few patients have been taught to take their injections at home and away from immediate medical supervision. Injection of the bromide salt in the doses employed does not lead to significant elevation of blood bromide; however, use of hexamethonium bromide orally in the larger doses necessary does lead to bromidism after a few weeks or months and is not recommended.

Hexamethonium chloride and bitartrate are apparently as effective as the bromide salt. The hexamethonium chloride ("methium") oral tablets now available contain 250 mg. The initial dose recommended by the manufacturer for hospitalized patients is 125 or 250 mg. The suggested dose subsequently is one tablet at each of four intervals during the first day to a total of 1 gm. for that day. If tolerated, two tablets should be given at each of four intervals the second day, a total of 2 gm. If tolerated by the patient the dose recommended for the third day is three tablets at a time, or 3 gm. for the day. This schedule agrees with the experience of most investigators, particularly when the smaller initial dose is used in patients who are seriously ill, those who have had previous sympathectomy, or those who have been maintained on a salt-free diet.

Our plan for initiation of therapy in hospitalized patients is usually the same but includes a more gradual daily increase for patients with advanced vascular disease. In patients with less serious hypertension our schedule continues the daily increments until four or five tablets are taken at a time. We have arbitrarily selected 5 gm. a day as the maximum dose. Encouraging therapeutic effects are thus achieved more frequently, but the incidence of serious side-effects increases as the dose exceeds 2 or 3 gm. daily. With the larger amounts marked hypotension and prostration have developed in some patients necessitating omission of several doses and then reinstitution of therapy with smaller doses that the patient tolerates better. As previously described [1] such marked reduction of blood pressure can be hazardous. Accordingly, our experimental trial with large doses is not now recommended. Most of those using hexamethonium bitartrate in England and many investigators who are using the chloride or bitartrate in this country limit the amount to 2 or 3 gm. daily. Thus most therapy is directed toward relief of symptoms and moderate reduction of blood pressure.

It is evident that a marked difference exists between the usual dose of hexamethonium for injection, 1.0 to 50 mg., and that for each oral administration, 125 to 750 mg. Absorption of hexamethonium ion after ingestion is evidently inefficient. Frequently a patient takes the drug several days before noticing any effects. Also there is a marked variation of the tolerated dose from patient to patient. This may be related to variable absorption or, as judged by changes of blood pressure, to variable effectiveness against the hypertensive disease process. The same patient often has unexplained variations from time to time. Of our 103 trial patients several had occasional occurrence of episodes of hypotension and associated prostration. One patient definitely cannot take the drug orally, regardless of the dose schedule, since he repeatedly swings from hypertension to hypotension.

Adjustment of the doses of hexamethonium for individual hypertensive patients can be guided by occurrence of the parasympatholytic side-effects of the drug or by the effect on blood pressure. Parasympatholytic effects—dryness of the mouth, blurring of vision, constipation, or occasionally diarrhea or alternating constipation and diarrhea—indicate absorption of therapeutically effective amounts. Heartburn, nausea, or anorexia also may occur. Interruption of the sympathetic pathways by block of efferent pathways of the sympathetic nervous system in the ganglions will reduce blood pressure and cause postural hypotension. Normotensive persons do not tolerate hexamethonium well because of postural hypotension. Hypertensive patients tolerate it better.

The sympathetic nervous pathways mediating neurogenic vasoconstriction are but one of several mechanisms causing hypertension. In some patients, renal, neurohumoral and other mechanisms, plus organic fixation of the peripheral resistance by arteriolar sclerosis are sufficient to sustain blood pressure even though function of the sympathetic nervous system is blocked. This is evidenced by results of "total sympathectomy." This operation is more extensive than the conventional splanchnicectomy. It includes removal of the paravertebral sympathetic chains, including the stellate and upper thoracic distribution to the upper body, cardiopulmonary and cerebral areas, and also the lower thoracic, upper lumbar, and splanchnic distribution to the lower body and abdominal viscera. It has been performed since 1940.[5] Present results indicate that reduction of blood pressure to near normal occurred and continues in 32% of the patients, definite reduction but not to normal in 44%, and no significant change in the supine position in 24%. It is encouraging that the five year survival rate, 86%, relief from symptoms, and protection against occurrence of malignant complications of hypertension have been achieved by a surgical procedure that may now be duplicated at least partially by use of a drug. It is also encouraging that arrest of the upward trend of blood pressure and relief of symptoms were obtained even in those patients, 24%, with no effect on blood pressure while reclining.

The variability of results of "total" sympathectomy suggests that adjustment of the dose of any drug that blocks the sympathetic nerves cannot be determined solely on the effect on blood pressure. Therapy directed toward regular reduction of blood pressure could cause overdosage, since certain hypertensive patients would not or could not safely have definite sustained reduction. Therefore, significant parasympatholytic side-effects and occurrence of postural hypotension seem the more reliable guides toward adjustment of dose of hexamethonium for the individual patient.

Ganglionic blocking agents interrupt sympathetic pathways incompletely, and a breakthrough can occur with strong stimuli, as shown by one of us (K. G.) and

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4. Reardon, M. J.; Marzoni, F. A., and Hendrix, J. P.: Effect of Neostigmine (Prostigmine) on Action of Tetraethylammonium (Etamon) in Dogs and Man, Federation Proc. 6: 364, 1947.

5. Grimson, K. S., and others: Results of Treatment of Patients with Hypertension by Total Thoracic and Partial to Total Lumbar Sympathectomy, Splanchnicectomy, and Celiac Ganglionectomy, Ann. Surg. **129**: 850-871, 1949.

co-workers [6] and Freyburger, Gruhzit, and Moe.[7] Effective does of adrenolytic or sympatholytic drugs afford better protection. Effective doses of the presently available adrenolytic drugs cannot be employed clinically because of their associated reflex tachycardia.[8] Accordingly, hexamethonium seems to be the best present medical approach toward blockade of the sympathetic nervous system. It should play an important role along with other standard medical and surgical methods of therapy.

Serious side-effects have been observed in our group of 103 patients treated with hexamethonium chloride or bitartrate during the last 18 months. Most frequent has been the occurrence of episodes of prostrating hypotension, obstipation, and ileus, lasting one to five days in two patients, hypotension and diarrhea lasting three days in one, and several episodes of hypotension lasting a day at a time in one patient who had constipation but no ileus. These disturbances of bowel habit and hypotensive episodes occurred while the patients were on prescribed treatment at home several weeks or months after the initial regulation in the hospital and while they were taking 3 to 5 gm. of the chloride or bitartrate daily. It is possible that the hypotension of the four with constipation resulted from accumulation or retention of the drug in the intestine and continuing absorption. Treatment consisted of withholding the drug, institution of gastric suction, and use of cathartics. Each patient subsequently resumed therapy. Every patient is cautioned that he must accomplish elimination at least every other day, using laxative diet and cathartics if necessary. Similar episodes of hypotension occurred in several hospitalized patients during institution of therapy.

Of the 103 trial patients, 63 were treated by one of us (K. G.), and for the most part they would meet conventional indications for sympathectomy. There were no fatalities. The remaining 40 were treated by one of us (E. O.), and for the most part they were older patients with advanced arteriosclerosis and cardiac, cerebral, or renal damage. There were three deaths. Two resulted from cerebral vascular accident eight and nine months after institution of therapy and while the patients were taking 1.75 and 2.5 gm. of the chloride daily. The third patient had uremia and was taking 0.5 gm. of the chloride daily. He died at home two weeks after exhausting his supply of the drug and discontinuing therapy. Also among this group of 40 patients are 3 with coronary heart disease and angina who, while taking 1.5 to 2.5 gm. daily, experienced symptoms of myocardial ischemia at the time of occurrence of hypotension and increase of side-effects of the drug. Angina occurred on three occasions for one, on two occassions for one, and once for the third. Two of these three patients are now taking 1.0 gm. and 0.75 gm. daily, and treatment was discontinued in the third, since he is confined to bed at home in heart failure. Another patient in this group experiences recurrence of hemiparesis and hemianesthesia for periods of an hour or more at times of hypotension and increased side-effects. These symptoms resemble those of his previous left hemiparesis. Of the entire group, 103 patients, 6 have discontinued therapy because of relatively minor side-effects, and of these 4 definitely presented problems of emotional instability or marked anxiety.

Most patients experience symptoms of postural hypotension at one time or another, and several have fainted while standing still, as, for example, while at church or waiting in a line. Syncope could be serious if these episodes occurred in circumstances that would preclude the supine position. There is a rumor, probably based on fact, that a patient taking hexamethonium closed himself in a telephone booth while making a call and when found had lost all cerebral function as a result of cerebral ischemia. Certainly each patient should be cautioned against the possibility of syncope while standing. A less serious side-effect is the not infrequent occurrence of impotency during the drug effect in males. Each occasionally discontinued the noon and evening doses and described return of libido, following which therapy was resumed.

As a result of these studies it is our present opinion that it is possible to use hexamethonium chloride or bitartrate in hypertensive patients who are not too critically ill. The risk does not seen prohibitive, provided therapy is started in the hospital after careful evaluation and the patient is carefully instructed. He should be given latitude to vary his dose, omitting one or two or reducing the amount whenever parasympatholytic side-effects or weakness with hypotension becomes pronounced. Although our patients are often encouraged to take 4 or 5 gm. daily, they are not held to a rigid schedule. Apparently most patients with serious organic arterial disease are able to sustain their blood pressure in spite of use of hexamethonium as described. In these as in the patients who have undergone sympathectomy and whose blood pressure is not markedly reduced, interruption of sympathetic efferent pathways mediating neurogenic pressor influences usually relieves symptoms and may favorably influence the course of the hypertensive disease process, even though blood pressure is not significantly reduced. Of our 103 patients, many described relief of symptoms, several maintain definite reduction of blood pressure, and a few have near normal blood pressure. Most have reduction of blood pressure while standing.

HYDRAZINOPHTHALAZINE HYDROCHLORIDE ALONE AND WITH HEXAMETHONIUM

In 1948 [6] 1-hydrazinophthalazine hydrochloride (C-5968, "apresoline") was first tested in patients. It is efficiently absorbed following ingestion. The oral and parenteral doses tested varied from 0.2 to 0.5 mg. per kilogram of body weight. Effective doses in dogs reduced blood pressure and diminished or prevented rise of blood pressure with strong pressor reflexes or injection of epinephrine. Two cross circulation studies in the isolated head failed to demonstrate a central site of action. Previous studies by Gross, Druey, and Meier,[9] Craver and Yonkman,[10] and others were interpreted as demonstrating a central site of action as well as a peripheral epinephrine antagonism. Their experiments were based on spinal cord section and isolated organ perfusion techniques in dogs and cats.

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[6] Grimson, K. S.; Chittum, J. R., and Longino, F. H.: Comparison of Effects of New Ganglionic Blocking Agent and New Sympatholytic, Federation Proc. **8**: 61, 1949.

[7] Freyburger, W. A.; Gruhzit, C. C., and Moe, G. K.: Pressor Pathways Not Blocked by Tetraethylammonium, Am. J. Physiol. **163**: 290, 1950.

[8] Grimson, K. S.: Consideration of Action and Uses of a Few of the Drugs Which Suppress or Interrupt Sympathetic Nerve Transmission, Angiology, to be published.

[9] Gross, F.; Druey, J., and Meier, R.: New Group of Depressor Substances with Special Type of Effect, Experentia **6**: 19, 1950.

[10] Craver, B. N., and Yonkman, F. F.: Some Pharmacological Properties of L-Hydrazinophthalazine, Hypotensive Agent, Federation Proc. **9**: 265-266, 1950.

Our studies in man[6] revealed that 1.0 to 2.0 mg. per kilogram given orally or intravenously usually blocked pressor reflexes, warmed extremities, and occasionally reduced blood pressure. Clinical trial in six hypertensive patients using doses varying from 25 to 100 mg. every four hours effected moderate temporary reduction of pressure. However, trial of therapy was discontinued within 33 days in each patient because of occurrence of severe headache or nausea and vomiting and because of relative ineffectiveness. Studies also revealed that there was some increase of blood flow through the kidneys. Gross and co-workers[11] also found definite though variable increase of renal blood flow.

Freis, MacKay, and Oliver[12] compared effects of "sympatholytic" drugs in man and concluded that hydrazinophthalazine hydrochloride differed from any of the other agents in that, in the doses employed, 18 to 30 mg., hypertension induced by arterenol (nor-epinephrine) was moderated and not blocked but that the bradycardia induced by arterenol was inhibited. He concludes that the drug interrupts this bradycardia reflex at an unknown point. Freis and co-workers[13] describe use of hydrazinophthalazine hydrochloride in continuing clinical trial. Freis states that the drug could not be given oftener than every 12 hours without the appearance of side-effects, particularly headache, or the development of tolerance. Therefore, for therapy he uses hexamethonium subcutaneously at 8 to 12 hour intervals, gradually increasing the dose to a total of 50 mg. of the ion. In some patients whose hypotensive effect from hexamethonium did not persist beyond six hours, hydrazinophthalazine hydrochloride was given orally midway between injections, the oral doses gradually being increased from 25 mg. to between 50 and 150 mg. Advantages of hexamethonium are described, and Freis prefers to employ this drug alone or in combination with the low sodium diet and/or hydrazinophthalazine hydrochloride.

Schroeder[14] administered hydrazinophthalazine hydrochloride to renal hypertensive dogs, giving 10 mg. every day or every other day, and he reports partial or complete control of hypertension. He states that the site of action of the drug is not known. Fifty patients were treated for 1 to 40 weeks. Significant lowering of diastolic blood pressure of 20 mm. Hg or more resulted in 35, but in only a few with the mildest hypertension were normotensive levels achieved. Schroeder[15] states that hydrazinophthalazine inhibits the pressor action of pherentasin,[16] hypertensin (angiotonin), and other endogenous hypertensive factors. At the time of his report 60 patients had been treated with oral doses of hydrazinophthalazine up to 900 mg. per day and of hexamethonium up to 6 gm. per day. He states, "the elevated blood pressure in benign hypertension was controlled at normotensive or near normotensive levels in almost every case. The malignant stage reversed itself in 18 of 20 cases."

Since serious misadventures have occurred with hydrazinophthalazine and hexamethonium used in this manner, Dr. Schroeder kindly furnished a current summary of his experience, a major part of which is quoted:

> Experiences with 120 cases of hypertension given hexamethonium chloride and l-hydrazinophthalazine (Apresoline) orally has indicated that blood pressure can be significantly lowered. . . . Fifty-five cases have been followed for four to eight months. . . . Only one case of tolerance has been encountered. . . . As with other new and potent therapeutic tools, the scope and limits of the method have been incompletely defined; however, chronic renal insufficiency appears to be irreversible and its course unchanged.
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> Such profound alterations of long-standing cardiovascular and renal abnormalities are potentially hazardous. Already certain dangers have become apparent, particularly in malignant hypertension. In 35 cases of malignant hypertension, too rapid reduction in blood pressure has resulted in uremia (2 cases), cerebral vascular accidents (2 cases) and multiple myocardial infarcts (1 case). In malignant hypertension with nitrogen retention, the "low-salt syndrome" has occurred twice when salt was unrestricted. Six deaths have occurred while patients were on treatment, one of acute interstitial pneumonia, two of what may have been hexamethonium poisoning, two of unknown causes, and one in a patient who developed tolerance to the drugs; all but one were in severe malignant stages with nitrogen retention. Less severe reactions included the recurrence of angina pectoris (2 cases) and high fever (1 case) induced by Apresoline, serous otitis media (6 cases), urinary retention in the bladder (3 cases), and the expected symptoms of autonomic blockade (all cases to some degree). Severe prolonged hypotension has resulted from small doses of either drug in patients suffering from malignant hypertension, uremia, apoplexy, and cardiac insufficiency. One case of sudden death reported to us occurred when both drugs were given together as an initial dose.
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> Of equal danger is the withdrawal of anti-hypertensive agents from patients in malignant stages. Of six discontinuing medication voluntarily or upon advice of a physician, all have died within four days to four weeks later, two of pulmonary edema, two of uremia and one each of apoplexy and encephalopathy. Withdrawal from patients in "benign" stages resulted in return of previous signs and symptoms. No serious reactions have occurred in such individuals.
>
> These two drugs used together are powerful anti-hypertensive agents. Increased sensitivity to each has been observed in malignant hypertension, cerebral vascular accidents, pulmonary edema and congestion and renal insufficiency.
>
> The possibilities of coronary thrombosis, thrombosis of cerebral arteries, reduction in renal blood flow leading to uremia, sudden death, and other accidents dependent upon hypotension are real. Relatively non-toxic in themselves, these two drugs used together cause profound changes in blood pressure which can be hazardous if not carefully employed, especially when given initially.
>
> During induction of control of blood pressure, hospitalization of the patient is essential. . . .
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> During control of blood pressure, after leaving hospital, the patient or a member of his family must measure blood pressure before each dose and omit hexamethonium accordingly, in order to avoid hypotensive episodes. Strict attention to bowels is essential. . . .

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[11] Gross, F.; Druey, J., and Meier, R.: Eine neu Gruppe blutdrucksenkinder Substanzen von besonderen Wirkungscharakter, Experentia **6**: 19, 1950.

[12] Freis, E. D.; MacKay, J. C., and Oliver, W. F.: Effect of "Sympatholytic" Drugs on Cardiovascular Responses to Epinephrine and Norepinephrine in Man, Circulation **3**: 254-259, 1951.

[13] Freis, E. D.; Finnerty, F. A., Jr.; Schnaper, H. W., and Johnson, R. L.: Treatment of Hypertension with Hexamethonium, Circulation **5**: 20-27, 1952.

[14] Schroeder, H. A.: Effect of l-Hydrazinophthalazine in Hypertension, Circulation **5**: 28-37, 1952.

[15] Schroeder, H. A.: Control of Hypertension by Hexamethonium and l-Hydrazinophthalazine: Preliminary Observations, A. M. A. Arch. Int. Med. **89**: 523-540 (April) 1952.

[16] Pherentasin is defined as a substance detected by assay in rats, which induces a prolonged pressor response, contains an amine and a carbonyl group necessary for activity, is nonprotein in nature, and can be procured from the arterial blood of many hypertensive patients at concentrations of 1 to 20 γ per liter. Schroeder, H. A., and Olsen, N. S.: Pressor Substances in Arterial Hypertension, J. Exper. Med. **92**: 545, 1950.

Dr. Schroeder also describes precautions with regard to small initial doses and gradual increase that are in accord with those of other investigators, which are summarized at the end of this report.

Taylor, Page, and Corcoran became interested in hydrazinophthalazine hydrochloride because of their hypothesis that a substance causing hypertension is liberated from the brain or brain stem. They report [17] that in isolated head, cross circulation experiments, stimulation of the central end of one or both vagi of the isolated head produced increase of blood pressure of the dog whose blood was used to perfuse the head when this dog was sensitized by bilateral nephrectomy and administration of tetraethylammonium chloride. Similar stimulation of the vagi in dogs with their spinal cords destroyed distal to the sixth cervical segment, and with nephrectomy and tetraethylammonium chloride, also produced increase of blood pressure. From pharmacological observations in these animals they conclude that a vasopressor substance is liberated into the blood. They state that the substance resembles serotonin. They have thus added another vasopressor substance to the many postulated by other investigators as playing roles in hypertension. Dr. Page reports that the activity of this new substance is inhibited and ultimately abolished by hydrazinophthalazine.

Page [18] used hydrazinophthalazine hydrochloride in 70 patients employing doses varying from 100 mg. to 1.4 gm. a day. He reports that 5 were unable to tolerate the drug, 33 had a fall of 20 mm. Hg diastolic pressure or more, 14 an equivocal fall, and 17 none. Headache occurred initially in 42% of the patients but disappeared spontaneously in 70%. Nausea appeared in 18% and vomiting in 12%. He states that for therapeutic purposes his group favors mixed treatment of hypertension: low-salt diet with hexamethonium, hydrazinophthalazine plus hexamethonium, etc. He suggests that in practice it would seem wise to start with one measure at a time, adding others as needed; however, he emphasizes the necessity of most careful evaluation of the individual drugs before combinations are created. He uses hydrazinophthalazine in hospitalized patients with malignant hypertension and has not reported death due to the drug.

Dr. Page also furnished a current summary of his experience, a major part of which is quoted below:

> From a study of the past year of patients treated with hexamethonium and/or Apresoline, we have formed clear impressions about some aspects of their action. Both drugs seem to have a definite place in current treatment of severe hypertensives. We know of no way to determine whether a response to the drugs will occur. Blood pressure in most patients is reduced if hexamethonium is given intramuscularly while probably not more than one half with Apresoline by mouth. . . .
>
> Both drugs are difficult to administer because of the many signs and symptoms elicited. Probably in most patients treatment should be begun in a hospital. We have had no fatalities among our patients, but believe they might have occurred had they been less carefully handled. Apresoline causes edema, headache, nausea, vomiting and occasionally mild anemia. Hexamethonium often causes severe orthostatic hypotension, urinary retention, severe constipation and even ileus, signs which are potentially dangerous.
>
> We believe these drugs are still very much in the experimental stage, Apresoline more so than hexamethonium. They should be used only under careful guidance of the physician. Their use may be compared with the care necessary for insulin or cortisone. We do not believe that deaths need occur if the actions of particularly hexamethonium are appreciated and the patients are carefully educated when the drugs are begun.
>
> It is of importance that physicians recognize that these are no wonder drugs. If exorbitant claims are believed, they are doomed to disappointment and premature discarding of the drugs. We believe that the world can and should await the outcome of some of the more carefully studied groups of patients and that physicians need not trade blow by blow publications until at least months, if not years, of observation can be made.

The extensive pharmacological studies concerning hydrazinophthalazine hydrochloride cannot be reviewed. They are summarized by stating that large doses are adrenolytic and sympatholytic, that smaller doses have these actions weakly, and that several investigators believe that the drug has a preponderant central action. All agree that the blood flow through the kidney is increased even though systemic arterial blood pressure may be reduced. Although pharmacological studies of the actions of hexamethonium alone and hydrazinophthalazine alone have been thorough, there is a paucity of studies relating to joint action of the drugs.

Our experiences with combined therapy in eight patients using hexamethonium chloride or bitartrate in amounts up to 5 gm. per day and with the addition of hydrazinophthalazine in amounts varying from 50 mg. every other day in one patient to 50 mg. every two hours in another patient indicate that usually the hydrazinophthalazine has not significantly lowered the blood pressure beyond that level already accomplished by the hexamethonium. However, these 8 patients were selected from the larger group, 103, because of failure of reduction of blood pressure with hexamethonium therapy. Also, administration of hydrazinophthalazine was started only after three weeks to six months of therapy with hexamethonium. We have not infrequently observed that paients receiving hexamethonium may have more reduction of blood pressure after a few weeks or months than occurred during their stay in the hospital. The one patient who takes one 50 mg. tablet of hydrazinophthalazine every other day in addition to her constant daily 5 gm. of hexamethonium chloride does have definite additional reduction of pressure. Certainly unpredictable results, including marked hypotension and prostration, could occur occasionally with the combined therapy. Our series is not large enough and our treatment using hydrazinophthalazine has not been aggressive enough to warrant definite evaluation at this time. The combined therapy is considered in an investigational stage and is undertaken only with extreme caution. Most investigators would agree that of the two drugs available for oral use the hexamethonium chloride is the most potent hypotensive agent and associated with the greatest risk.

From the results of clinical trial quoted above and from reports and conferences with other investigators not quoted though doing excellent work in this field, it seems evident that several statements would express current thinking. These statements are given in the hope that the information may reduce the number of misadventures that might occur as hexamethonium, in oral tablets, and hydrazinophthalazine hydrochloride, in oral tablets and vials, have recently been made available for general prescription. The injectable form of hexamethonium bromide already available for prescription has the safeguard that the drug is usually used in the hospital under direct medical supervision. Nevertheless, injections should be employed with the same precautions applicable to the medication for oral use. Hexamethonium given orally may well prove a valuable drug for many patients with hypertension. It should, however, not be considered a panacea and does not replace all other medical and surgical methods of therapy. Hydrazinophthalazine, although a less potent antihypertensive drug, may prove useful for certain problems. Its complex actions might aid the treatment of disorders such as toxemias of pregnancy or early malignant hypertension in which altered renal blood flow and participation of hypertension (angiotonin) or other humoral pressor substances are frequently implicated. The statements or cautions with regard to use of hexamethonium chloride and bitartrate or hydrazinophthalazine follow:

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[17] Taylor, R. D.; Page, I. H., and Corcoran, A. C.: Hormonal Neurogenic Vasopressor Mechanism, A. M. A. Arch. Int. Med. 88: 1-8, 1951.

[18] Page, I. H.: Treatment of Essential and Malignant Hypertension, J. A. M. A. 147: 1311-1318 (Dec. 1) 1951.

1. Therapy should be instituted slowly during careful observation in a hospital, particularly when hexamethonium is used.
2. Minimum prerequisite examinations should include careful retinoscopic study to exclude papilledema with associated encephalopathy and hazard of respiratory arrest from sudden reduction of blood pressure; careful cardiac evaluation, including an electrocardiogram, since coronary disease makes marked hypotension or tachycardia hazardous; careful renal evaluation, including at least a determination of nonprotein nitrogen in the blood and a phenolsulfonphthalein excretory function test, since reduction of pressure can precipitate uremia; careful complete physical examination; and careful history ascertaining previous evidence of arterial insufficiency, i. e., angina or symptoms of cardiac decompensation, severe headaches of encephalopathy, paroxysmal nocturnal dyspnea, and unilateral numbness or weakness or actual hemiplegia.
3. In patients with encephalopathy or damaged myocardium either drug if used at all should be given cautiously and in small amounts. In patients with markedly diminished renal function excretion of hexamethonium may be impaired, accumulation and intoxication may result, and hypotension if it develops may accelerate uremia.
4. Patients previously treated by sympathectomy usually tolerate smaller doses and should receive very small initial doses.
5. Patients should be carefully instructed concerning side-effects and associated hazards. Also they should be instructed to reduce or vary the dose according to their symptoms.
6. Other regimens and medications have been employed with either of the drugs, but little is known as yet concerning synergism and hazards. Salt depletion diet with hexamethonium has resulted in low-salt syndrome. Sedatives (barbiturates) used with hydrazinophthalazine hydrochloride have resulted in excessive drowsiness. With either drug tolerance for alcohol may be decreased.
7. Combined use of hexamethonium and hydrazinophthalazine is a procedure presently under trial, with hexamethonium usually being used first and with hydrazinophthalazine being added after a week or more. Combined therapy is considered by all investigators an experimental procedure associated with definite hazards.

Duke University (Dr. Grimson).

EXPANDING INTRACRANIAL LESIONS IN CHILDHOOD

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and
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Information concerning expanding lesions caused by localized tumefaction within the growing skull is accumulating in medical literature at an accelerating pace. Progress in diagnosis and treatment has so advanced in recent years that all practitioners must be alert to the reality that expanding lesions of the neoplastic group are by no means rare and that, although certain of these lesions may masquerade in childhood as meningoencephalitis, many reveal themselves in readily interpretable syndromes and some are favorably influenced by surgery or irradiation, or both.

This report is drawn from 104 cases studied at the Denver Children's Hospital. Only those cases in which the final clinical diagnosis was "brain tumor" are considered. A careful analysis of hospital records and surgical or autopsy material has been made. Some of the histologic diagnoses listed in the older records have been reclassified after a study of the sections in keeping with the more clearly defined entities now recognized. Special attention has been given to the symptomatology, to the physical signs, and to correlation of the pathology with the clinical course and prognosis. Similar studies in the past have served to strengthen tenets already held, have revealed erroneous conclusions, and in occasional instances have unearthed new diagnostic aids. The purpose of this investigation has been to inquire into our own experience with the hope of adding to this growing fund of knowledge by analyzing our successful diagnostic efforts as well as searching for the factors which led, either by acts of commission or omission, to erroneous diagnoses. The results of the analysis should prove of interest to clinicians and pathologists alike.

A classification of expanding intracranial lesions in childhood must be somewhat overlapping if it is to be all-inclusive. The following outline includes the categories that must be considered when the clinician and pathologist entertain a diagnosis of "expanding intracranial lesion" in a child:

From the Department of Pathology, Children's Hospital.

1. Tumors of the glioma group.
2. Neuroectodermal tumors.
3. Tumors arising from the meninges.
4. Blood vessel tumors, including congenital anomalies.
5. Tumors occurring in the region of the sella turcica.
6. Tumors arising from the remnants of the notochord.
7. Infectious granulomas.
8. Tumors arising from the calvarium.
9. Tumors arising from the roots of the cranial nerves.
10. Metastatic tumors.
11. Miscellaneous expanding intracranial lesions (including brain abscesses).

Tumors of the glioma group arise from glial cells and their evolutional antecedents. There are two potential lines of development that a primitive cell of the neuroepithelial tube may take. This primitive cell, the "medulloblast," may thus develop in the direction of a glial cell or in the direction of a neuron or ganglion cell. The glia cells, or neuroglia, are represented in the adult brain and spinal cord by five cells: the oligodendrocyte, the astrocyte, the ependymal or "lining cell," the pituicyte, and the cell of the pineal parenchyma. The neurons of the adult brain are ganglion cells, which vary in structure with their location, such as the "Betz" cells of the cerebral cortex and the "Purkinje" cells of the cerebellum. In their development from the primitive medullary epithelium these adult cell forms pass through several stages of evolutional growth; this is well portrayed in the schematic concept as modified from that of Percival Bailey (see accompanying figure).

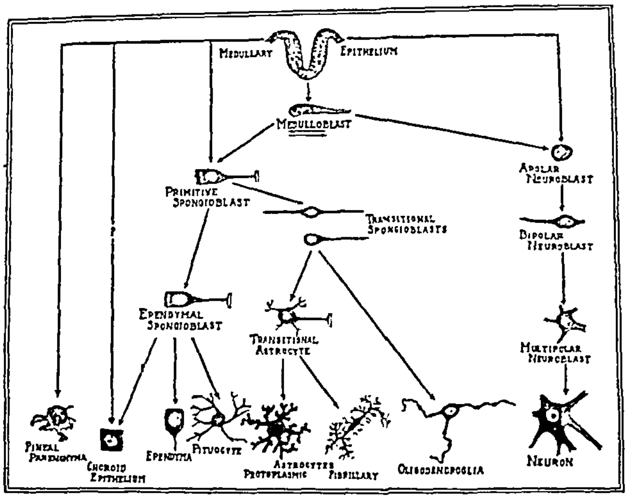
The function of astrocytes and oligodendrocytes is supportive, and they envelop the blood vessels and ganglion cells with their processes, isolating the nerve elements (the ganglion cells) from the mesodermal connective tissue structures.

A third cellular element in the adult brain and spinal cord arises from mesoderm. The cells of this type are known as the microglia of Hortega, and they are, as Hassin points out,[1] the histiocytes of the central nervous system.

The term "glioma" is applicable to tumors that arise from glial cells or from their evolutional precursors. Although medulloblasts are bipotential, a medulloblastoma is by custom considered a glioma. Other gliomas of present day nomenclature are the astrocytoma, astroblastoma, glioblastoma multiforme, spongioblastoma polare, ependymoma and ependymoblastoma, pinealoma, oligodendroglioma, papilloma choroideum, and neuroepithelioma. Almost without exception the gliomas have many types of neuroglia in their framework, but their dominant cell and architectural arrangement usually permits of a single classification. Some gliomas are histologically "benign," but most are in all respects malignant. Because of the problems of surgical approach, and because of the usual inexpansibility of the cranial vault, the "benignity" of a glioma is often of academic rather than of prognostic significance.

The astrocytoma of the cerebellum has often been cited as the commonest single type of intracranial tumor in children. Among the writers pointing this out have been Bucy [2] and Cushing.[3] Astrocytomas are of the so-called benign group, and the signs and symptoms that accompany them approximate those produced by the medulloblastoma and by an occasional sarcoma of the leptomeninges. In the usual course they develop more slowly than these latter tumors, but this may be an imperceptible difference.[4] Cerebellopontine angle invasion, with its lateralization, may more frequently result from astrocytomas, but many types of tumors may be responsible for this syndrome. Astrocytomas are characteristically uninfluenced by irradiation, but when fortuitously situated early diagnosis and skilful surgery can result in complete recovery.

Medulloblastomas also arise in the posterior fossa, classically in the midline of the cerebellum in children. They sometimes occur in adults and are then usually found in the body of the corpus callosum or in the adjacent corona radiata.[5] A recent report by Ingraham, Bailey, and Barker [4] indicates that a significant number of medulloblastomas in children do not arise in the midline. Medulloblastomas are always malignant, and no tumor of this type has ever been successfully removed.[2] They are very susceptible to roentgen therapy, and recent advocates [6] hold that adequate irradiation preceded by aspiration biopsy to confirm the diagnosis offers a longer symptom-free life expectancy than the combination of craniotomy followed by irradiation. The rationale favoring this conclusion is the established fact that a medulloblastoma can seed secondary sites within the subarachnoid space, especially along the cord, and that the unavoidable trauma of surgical intervention hastens this dissemination. The average length of life from the time of diagnosis for children with this tumor is now 16 to 18 months.[4] The aspiration biopsy method has not been in use long enough to determine whether these figures should be revised.



Schematic drawing of the development of the cells of the central nervous system.

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1. Hassin, G. B.: Histopathology of the Peripheral and Central Nervous System, Chicago, G. B. Hassin, 1948.

2. Bucy, P. C.: A Round Table on Tumors, Tumors of the Brain in Childhood, J. Pediat. 30: 726 (June) 1947.

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5. Courville, C. B.: Pathology of the Central Nervous System; A Study Based upon a Survey of Lesions Found in a Series of Fifteen Thousand Autopsies, Mountain View, Calif., Pacific Press Publishing Association, 1945.

6. Pierce, C. V.; Cone, W. B.; Bouchard, J., and Lewis, R. C.: Medulloblastoma: Non-Operative Management with Roentgen Therapy after Aspiration Biopsy, Radiology 52: 621 (May) 1949.

Glioblastoma multiforme is as malignant as the medulloblastoma. It may arise in any area of the brain in children. Occasionally seen in the brain stem, spinal cord, and cerebellar peduncles, it has rarely been reported in the vermis of the cerebellum. It tends to undergo extensive degeneration. Cellular polymorphism is a characteristic, but the common cells recognized are spongioblasts and astrocytes. Mitotic figures are numerous, and the clinical course is short.

Spongioblastoma polare is, as a rule, slow to grow, circumscribed but not encapsulated, and very rarely contains mitotic figures. The type cell is the unipolar or bipolar spongioblast, and the common site of origin is in the temporal lobe, the tuber cinereum, or other structures at the base of the brain.

Ependymomas are slowly growing neoplasms derived from the ependymal cells lining the cerebral ventricles and central canal of the spinal cord. Ependymoblastomas are similar, but less differentiated, tumors. Both usually arise from the floor of the fourth ventricle, and, since they so often involve vital cranial nerve tracts, their complete surgical removal is seldom accomplished. Moreover, they are not influenced by irradiation. At least 13 cases have been reported,[7] to which we now add another, in which an intracranial ependymoma has produced implants in the spinal subarachnoid space. In our series a 3-year-old girl (case 44) had surgical removal of an ependymoblastoma involving the left occipital lobe. During the next seven years her treatment consisted of one subsequent surgical removal (at age 6) and of several courses of roentgen therapy. She was symptom-free for long periods between therapeutic procedures. About six and one-half years after onset of her first symptoms, signs and symptoms of an intracranial recurrence again developed, with the additional manifestations of a spinal cord tumor. At autopsy, seven years after the diagnosis was first made, the tumor in the left occipital lobe was found to have undergone differentiation to an ependymoma and also was found to have direct prolongations to both cerebellar hemispheres. In addition, several large, fusiform ependymomas were found in the subarachnoid space of the thoracic spinal cord.

Pinealomas, primary gliomas of the pineal gland, are among the rarest intracranial tumors and, because of their location, have seldom been successfully removed. Occasionally these tumors also seed implants in the ventricular system, particularly in the infundibulum of the third ventricle, or spread widely in the meninges.[8]

The oligodendrogliomas, with few exceptions, are tumors of the cerebral hemispheres of adults. At least one, however, has been reported occurring in the pons of an infant,[9] and two have been reported arising in the cerebellum, one of these in a 13-year-old girl.[10] Histologically these tumors are benign and have a marked tendency to accumulate calcareous deposits. Degeneration is the exception and is never extensive.

The papilloma choroideum, possessed of a narrow stalk, is often inaccessible to the surgeon, and its successful removal has rarely been recorded. Finger-like extensions of the tumor may extend into the brain substance, and rarely fragments of the tumor may be implanted in distant parts of the ventricular system.[8]

Neuroepitheliomas are usually found in the retina and are characterized by numerous rosettes of neoplastic cells. The cell type resembles a primitive spongioblast. They seldom occur in the brain proper.

The second group in our classification is the "neuroectodermal tumors." These tumors apparently spring from bipotential cells of the medullary canal and thus are made up of cellular components having in some instances neuronal, and in others, glial characteristics.[11] They may arise anywhere within the brain and are classified as malignant tumors.

Next in our outline are the tumors that spring from meningeal cells. Three types will be noted here. The first of these is the meningioma, usually histologically benign, and rarely met with before the 20th year. Second is the diffuse sarcoma of the leptomeninges, and third, the "angioblastic meningioma." Since the prevailing opinion among histologists today is that the pia and arachnoid are of mesodermal origin, malignant tumors arising from these layers are classified as sarcomas. Three types of cells can be identified in the mature leptomeninx, i. e., the fibrous connective tissue cells, the cap cells,[12] and the cells making up the blood vessels and their sheaths. The tumors of the leptomeninx, therefore, have three potential parent cell types, although many authors hold that the sarcomas are all of fibroblastic origin. So-called angioblastic meningiomas arise from the cells which give rise to blood vessels and their sheaths in the leptomeninges. These are cellular, encapsulated tumors traversed by masses of reticulin and capillaries and containing large vascular cavities, most of which are empty. The tumor is rapidly growing, but does not metastasize. It is a distinctly different lesion from those represented in our fourth category.

The tumors in this fourth group are those made up of blood vessels and include both neoplastic lesions and congenital vascular anomalies in the brain proper. Cavernous hemangiomas in the brain may involve capillaries, veins, or arteries, all fully differentiated. They appear as huge dilatations of vessels but may in reality be inborn anomalies or malformations of blood vessels. The Weber-Sturge syndrome, a "port-wine" hemangioma of the face in combination with a hemangioma of the brain, is included in this category. Another lesion in this group is the hemangioblastoma, which, although benign, is not an anomaly but a true neoplasm consisting of proliferated blood vessel cells or angioblasts. It occurs principally in the cerebellum but may also be found in the retina, where it is known as "Hippel's disease." It may also be seen as a combination of multiple cerebral angiomas and angiomatous lesions in the kidneys, pancreas and adrenals, a pathologic entity known as "Lindau's disease."

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[7] Chusid, J. G.: Ependymona in Third and Fourth Ventricles with Implants in Spinal Subarachnoid Spaces, Arch. Neurol. & Psychiat. 59: 408 (March) 1948.

[8] Bailey, P.; Buchanan, D. N., and Bucy, P. C.: Intracranial Tumors of Infancy and Childhood, Chicago, Univ. of Chicago Press, 1949.

[9] Hughes, R. R., and Couper, E. C. R.: Oligodendroglioma in an Infant of 8 Months, Arch. Dis. Childhood 17: 147 (Sept.) 1942.

[10] Wycis, H. T.: Oligodendroglioma of the Cerebellum, Arch. Neurol. & Psychiat. 59: 404 (March) 1948.

[11] Kuhlenbeck, H., and Haymaker, W.: Neuroectodermal Tumors Containing Neoplastic Neuronal Elements: Ganglioneuroma, Spongioneuroblastoma and Glioneuroma, with Clinicopathologic Report of 11 Cases, and Discussion of Their Origin and Classification, Mil. Surgeon 99: 273 (Oct.) 1946.

[12] Bailey, O. T.: Histologic Sequences in Meningioma, with Consideration of Nature of Hyperostosis Cranii, Arch. Path. 30: 42 (July) 1940.

A fifth major category is composed of tumors that arise in the region of the sella turcica. Such lesions sometimes result in diabetes insipidus, or symptoms and signs related to pressure on the optic chiasm. Generally one thinks first of the craniopharyngiomas or the pituitary adenomas when such findings are described. However, other tumors so located may simulate these two more common lesions. Examples of these are suprasellar meningioma, suprasellar chordoma,[13] teratomas, aneurysms, tumors of the third ventricle, and rarely metastatic tumors growing in the pituitary gland or optic chiasm. Tumors of the pars nervosa of the pituitary gland are known as "choristomas" and are exceedingly rare. They are of microscopic size and consist of foci of large oval cells which are probably glial cells.

Craniopharyngiomas, known also as Rathke pouch cysts, arise from remnants of the craniopharyngeal duct. They have been reported as constituting about 13% of intracranial tumors in children.[14] It is not usual to find that the child harboring a craniopharyngioma has the sharp bitemporal defects in his visual fields that characterize the pituitary adenomas. Because craniopharyngiomas usually originate in the pars tuberalis and grow upward to occlude the third ventricle, they are apt to give rise to signs of increased intracranial pressure. They are composed of stratified squamous epithelium and microscopically are almost always benign. In 1927, however, Peet [15] reported a carcinomatous change in a craniopharyngioma of the adamantinomatous variety. Since craniopharyngiomas are so closely adherent to the under surface of the hypothalamus, complete removal without destruction of this vital brain center is rarely possible. The patient with a craniopharyngioma can often be temporarily relieved of troublesome symptoms, but he is rarely cured.[2]

Pertinent to the differential diagnosis of tumors in the region of the sella turcica is the fact that, in Cushing's series of 338 pituitary adenomas,[16] there were only three patients under age 18. Ingraham and Scott,[14] in noting this and their own experience, state that "with a history of failing vision, headaches and vomiting, and the finding of calcification in or above the sella turcica on roentgen examination, a diagnosis of craniopharyngioma can usually be made unequivocally in children." A note of caution in such exclusive views, however, is introduced by our own series, in which there were two pituitary adenomas and nine craniopharyngiomas.

The gigantism associated with an eosinophilic adenoma of the pituitary gland and the Cushing syndrome of basophilic adenoma are familiar entities to students of medicine. The chromophobe cell is glandularly inert, and usually a chromophobe adenoma causes hypopituitarism only incident to pressure atrophy of the gland and usually after the tumor has already bulged through the overlying tentorium sella. Whereas the eosinophilic and chromophobe adenomas attain large size, the basophilic adenomas are almost always of small size and are seldom found in the gross examination. In some of the larger adenomas calcium may be seen radiographically, and Courville [5] states that this is most often seen in those of the eosinophilic variety. However, calcification is far more often seen in craniopharyngiomas than in pituitary adenomas. In Cushing's study,[16] calcareous deposits were seen in 71% of craniopharyngiomas.

The sixth division of our classification concerns tumors that arise from remnants of the notochord. These lesions have their origin in the embryonic vestiges that usually lie at the spheno-occipital synchondrosis, or in vertebral bodies or intervertebral cartilage. In early embryonic life the cephalic end of the notochord is in close approximation with the infundibular process. During the sixth week the notochord seems to pull away from the infundibulum, or pars nervosa, and at this time remnants of the notochord may be found adjacent to Rathke's pouch or in the mesenchyme dorsal to the pharynx. At the close of the second month of embryonal life the mesenchymal elements at the base of the skull have surrounded these notochordal rests back to the spinal column. Usually the regressing notochord is caught in the sphenoid bone and basilar process of the occipital bone, but it may happen that some of these remnants escape such inclusion and bend ventrally into the dorsal pharyngeal wall, or dorsally into the base of the skull.[17] Chordomas may, on rare occasions, be found in a suprasellar position as previously noted, but they are far more often found as projections from the middle of the clivus of the sphenoid bone. Microscopically they may be either benign or malignant.

Seventh in our classification are the infectious granulomas. Infrequently seen in America today, tuberculomas were reported by Garland and Armitage [18] in 1933 as constituting 66% of all intracranial tumors seen in Leeds, Scotland. Among our own case records tuberculomas producing symptoms of expansile lesions were found in only two patients. Other granulomatous lesions even more infrequently encountered in the United States today are the toruloma and actinomycoma.

Tumors arising from the calvarium are another rare entity in children. In early life osteogenic sarcoma of the temporal bone [5] has been seen. Cholesteatomas are avascular, benign, slowly growing tumors of various sizes, sharply delimited and arising principally from the pia mater at the base of the brain, though certain writers contend that they are actually retention cysts of the arachnoid membrane. They sometimes give symptoms because of erosion of the inner table of the skull and so are included in this category.

In all of the more comprehensive reports on intracranial tumors in infancy and childhood, tumors of cranial nerves have either been absent or numerically inconspicuous. However, gliomas of the optic nerve or chiasm are on record, as are neurofibromas and ganglioneuromas of the trigeminal nerve and ganglion. The neurofibroma of the eighth nerve, the so-called acoustic neuroma, is extremely rare in children.

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[13] Bailey, P., and Bagdasar, D.: Intracranial Chordoblastoma, Am. J. Path. **5**:439 (Sept.) 1929.

[14] Ingraham, F. D., and Scott, H. W., Jr.: Craniopharyngiomas in Children, J. Pediat. **29**:95 (July) 1946.

[15] Peet, Max M.: Pituitary Adamantioma: Report of 3 Cases, Arch. Surg. **15**:829 (Dec.) 1927.

[16] Cushing, H.: Intracranial Tumors, Notes Upon a Series of Two Thousand Verified Cases with Surgical Mortality Percentages Pertaining Thereto, Springfield, Ill., Charles C Thomas, Publisher, 1932.

[17] Patten, Bradley M.: Human Embryology, Philadelphia, The Blakiston Company, 1948.

[18] Garland, H. S., and Armitage, G.: Intracranial Tuberculoma, J. Path. & Bact. **37**:461 (Nov.) 1933.

Tenth in the classification are the metastatic intracranial tumors, lesions that are definitely curious findings in the pediatric age group.[2] When they exist, they seldom declare themselves before the primary tumor has been identified.

Our 11th and final group includes a heterogeneous array of lesions, few of which are ever mistaken clinically for intracranial neoplasms. Included are the colloid cysts of the third and lateral ventricles, the origin of which is in considerable debate,[1] congenital stenosis of the aqueduct of Sylvius, dermoid cysts of the brain (these are usually subpial but may be extradural or arise between the tables of the skull), brain abscesses, and subdural hematomas, particularly those with no history of trauma.[19] Subdural hematomas, from the experience at this hospital, are relatively common lesions, but, because they are rarely mistaken clinically for neoplasms, none of ours was deemed worthy of inclusion in this study. Brain abscesses are similarly not found in our statistical analysis because none of the few which were seen in the 22-year period covered by this paper were classified as an "expanding intracranial lesion."

TABLE 1.—*Symptoms of Onset of Intracranial Lesions*

First Symptom	No. of Cases	First Symptom	No. of Cases
Vomiting	21	Dizziness	2
Headache	20	Signs and symptoms of diabetes insipidus	2
Cerebellar ataxia and difficulty with gait	14	"Not feeling well"	2
Nuchal rigidity	9	Drowsiness	2
Convulsion	5	Enlarging head	3
EOM palsy *	4	Fever	2
Developmental arrest	5	Personality change	1
Weakness in extremities	3	Spots before eyes	1
Loss of vision	3	Rapid growth (eosinophilic adenoma)	1
Exophthalmos	3		

* Palsy of extraocular muscles.

With this introduction we pass to the statistical phase of the paper, with attention mainly given to those features of interest to the practicing physician.

ANALYSIS OF CASES

The hospital records disclose that 104 children with expanding intracranial lesions due to localized tumefaction have been admitted to the Denver Children's Hospital during the 22-year period ending July 1, 1951. Cases in which an admission diagnosis of "brain tumor" was not subsequently supported by further study, or was later replaced by another diagnosis, and cases in which the parents did not consent to investigative procedures, removing their child from the hospital before sufficient evidence could be accumulated to support or nullify the diagnosis, are not included in this paper. Of the 104 cases, 90 were proved histologically, and only these were included in this statistical analysis. In 9 of the excluded cases there were histories and clinical findings that were typical of those produced by rapidly growing intracranial lesions but were not histologically confirmed. In some of these, x-ray therapy was carried out without biopsy and with subsequent improvement of the patient. Most of these patients have died with terminal courses in keeping with the provisional diagnosis. In at least three of these 14 cases the histologic sections have been removed from the files and the cases are therefore not included. In two more, the tumors were directly observed at surgery but were inoperable and were not subjected to biopsy.

Age, Sex, and Location.—All the patients studied were less than 15 years of age. Fifty-five were males, and 35 were females. Forty-five of the lesions were infratentorially situated, 38 were in a supratentorial position, and 7 extended into both regions. Three of the latter were sarcomas of the leptomeninges, and there was one each of an ependymoma, spongioblastoma polare, metastatic sarcoma from the tonsillar area, and multiple tuberculomas.

Tumor Types.—Forty-nine of the 90 expanding intracranial lesions were gliomas. The ependymoma group, with 11 ependymomas and four ependymoblastomas was the most frequently seen tumor group. There were 11 medulloblastomas and eight astrocytomas. Seven cases of spongioblastoma polare and five of glioblastoma multiforme were encountered. There were smaller numbers of the other gliomas. No case of oligodendroglioma was seen in this series. Thirty-seven of the gliomas were infratentorially situated, and 10 were in a supratentorial locus. One spongioblastoma polare and one ependymoma extended into infratentorial and supratentorial areas. We can thus concur with Bailey, Buchanan, Bucy, Cushing, and many others that gliomas in children occur far more frequently below the tentorium cerebelli than above, but at the same time we wish to emphasize that, when one considers all the different types of expanding intracranial lesions that the clinician encounters in children, the infratentorial location, at least in our series, is not nearly so favored.

Symptoms.—When attention was turned to symptomatology, it was at once apparent that multiple rather than single symptoms were offered as the chief presenting complaints. Vomiting and headache were most often recorded as the first disturbances and were still prominent as the presenting complaints, although paralyses and weakness of muscles of the face and extremities and diminished vision were frequently given as immediate causes for seeking hospitalization. Table 1 lists the symptoms of onset.

The total symptoms elicited in each history were tabulated, and vomiting was by far the commonest symptom noted. The character of the vomiting was carefully inquired into, and only infrequently was it described as being "projectile." Headache, paralyses, and disturbances in gait or difficulty in maintaining balance were also frequently related in the history. The character and location of the headache varied so widely that it seldom had localizing significance. Convulsions were notable for their infrequency, and when observed were as often misleading with reference to the site of the lesion. The low incidence of nausea and anorexia (even though the vomiting was usually not projectile) is reflected in the fact that only eight patients gave a history of weight

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19. (*a*) Scott, M.: Spontaneous Nontraumatic Subdural Hematomas, J. A. M. A. **141**: 596 (Oct. 29) 1949. (*b*) Walker, A. E., and Hopple, T. L.: Brain Tumors in Children, General Considerations, J. Pediat. **35**: 671 (Dec.) 1949.

loss, though in many instances the onset of tumor symptoms had apparently occurred weeks or months before admission to the hospital. A change of personality from congeniality to marked irritability appeared to be associated more frequently with tumors in the pons than with tumors in any other region.

Physical Findings.—Of the physical findings, choked disk was the most frequently observed, even though only 10 patients presented the complaint of diminution of vision. Probably this can be accounted for in that a child may be less alarmed or less aware of a gradual loss of vision than an adult. Thirty-six patients had ocular or facial palsy, and nystagmus and hyperactive reflexes were next in order of occurrence. Table 2 gives a complete list of the physical signs.

The ability to stand in Romberg's position was tested in 30 of the 90 patients; if performed with other patients, it was not recorded. Marked difficulty or actual inability to perform this test was detected in 22 patients. When a tumor was present in the cerebellum, the sign was positive in 11 and negative in two children. It was also positive in three patients whose tumors were confined to the fourth ventricle, one whose tumor was confined to the third ventricle, three whose tumors were confined to the pons, one with a craniopharyngioma, one with a tumor of the pineal gland, one with a tumor in the cerebellopontine angle, and one with a sarcoma of the leptomeninges which involved the cerebrum, cerebellum, brain stem, and meninges generally. A positive Romberg sign, therefore, though tending to place the tumor in or near the cerebellum, certainly does not eliminate many other sites.

Age Distribution.—In previously reported series, age distribution curves have usually shown an elevation at or near the 5-year group.[19b] In the review of our records the largest number of cases (12) was found in the 6-year-old group, but 11 cases were found under one year of age, 10 had an age of one year at onset of symptoms, and 11 were two years old when symptoms or signs were noted. This makes a total of 32 occurring under 3 years of age. There was no statistically significant variation from birth to age 10 years. The age at onset appeared to be of no value in predicting the type of lesion one may expect in any given patient.

In no case record did it appear that a definite and complete remission had been experienced. Only four or five records suggested the possibility of remission, and then the reference was usually to the subsidence of one symptom while others grew severer.

Laboratory Findings.—As has been consistently noted by other investigators the standard laboratory procedures reveal no appreciable alteration that cannot be attributed to complicating conditions. We believe that it is wise to abstain from spinal puncture in the presence of papilledema or other evidence of increased intracranial pressure. Spinal fluid examination was performed in 57 of our cases, and no explanation for the wide variation in protein and sugar values could be found. Protein values ranged from 4 mg. to 690 mg. per 100 cc. The spinal fluid pressure in children is subject to a wide artefactual variation owing to the struggle often undergone in obtaining the reading. Concerning pleocytosis, it is of some interest that, of the nine children whose spinal fluid contained more than 10 cells per cubic millimeter, three had medulloblastomas, three sarcomas of the leptomeninges, two ependymomas, and one a pinealoma, all of these tumors being capable of metastatic seeding. One wonders how many of these children had metastatic tumors in their spinal subarachnoid space rather than a simple pleocytosis of leukocytes.

Skull X-Ray.—X-rays of the skull were made in 63 of the 90 cases. According to recent authors routine skull x-rays are a basic procedure in the study of a suspected brain tumor.[19b] Widening of sutures, intracranial calcification, and distortion or erosion of the calvarium are findings that aid the diagnosis and may even localize the tumor. On these criteria alone, the diagnosis was supported in our series on 47 occasions, or in two cases in every three. Of nine patients with craniopharyngiomas, eight had skull roentgenograms; the diagnosis was made or confirmed by this means in seven, and one was read as a "negative skull."

Air Studies.—Since pneumoencephalography is contraindicated in the presence of increased intracranial pressure, the procedure was done only three times, twice without definitive results. Ventriculography was performed in 24 cases. In 10 of these it was read as "hydrocephalus," with the position of the tumor left somewhat in doubt. In 13 cases the procedure definitely localized the tumor. In one case the ventriculogram revealed distortion of the fourth ventricle by dorsal bulging of the pons. This was interpreted as a "pontine tumor," but at surgery subsequently done in another hospital an aneurysm of the circle of Willis was found. One death occurred during ventriculography, and this patient was found at autopsy to have a huge ependymoma arising in the pineal recess of the third ventricle and extending through the aqueduct of Sylvius into the fourth ventricle.

TABLE 2.—*Physical Signs in Cases Reported*

First Symptom	No. of Cases	First Symptom	No. of Cases
Choked disk	48	Sluggish reflexes	10
EOM * and facial palsies	36	Spasticity of extremities	8
Hyperactive reflexes	28	Listlessness, stupor, coma	7
Nystagmus	29	Enlarged head	7
Unequal or unreactive pupils	25	Speech difficulty	7
Babinski reflex	24	Paralysis of tongue	6
Possible Macewen sign	22	Sleep disturbance	6
Hydrocephalus	20	Developmental arrest	4
Ataxia generally	21	Excessive irritability	6
Nuchal rigidity	17	Chorea	2
Romberg sign	21	Exophthalmos	1
Paralysis or weakness in extremities	15	Diplopia	1
Loss of vision	10	Idiocy	1

* Extraocular muscles.

In reviewing skull x-ray and ventriculography records, it must be remembered that the series reviewed covers over 20 years. The increased interest and improved technique of the last few years have made these procedures increasingly helpful in the diagnosis of expanding intracranial lesions in children.

In this study we encountered five excellent examples of how the welfare of the patient and the accuracy of the diagnosis may be jeopardized by the omission of ventriculography. One patient (Case 48-35924), a 3½-year-old neurofibroma of the eighth nerve, the so-called acoustic neuroma, is extremely rare in children.

Tenth in the classification are the metastatic intracranial tumors, lesions that are definitely curious findings in the pediatric age group.[2] When they exist, they seldom declare themselves before the primary tumor has been identified.

Our 11th and final group includes a heterogeneous array of lesions, few of which are ever mistaken clinically for intracranial neoplasms. Included are the colloid cysts of the third and lateral ventricles, the origin of which is in considerable debate,[1] congenital stenosis of the aqueduct of Sylvius, dermoid cysts of the brain (these are usually subpial but may be extradural or arise between the tables of the skull), brain abscesses, and subdural hematomas, particularly those with no history of trauma.[19] Subdural hematomas, from the experience at this hospital, are relatively common lesions, but, because they are rarely mistaken clinically for neoplasms, none of ours was deemed worthy of inclusion in this study. Brain abscesses are similarly not found in our statistical analysis because none of the few which were seen in the 22-year period covered by this paper were classified as an "expanding intracranial lesion."

TABLE 1.—*Symptoms of Onset of Intracranial Lesions*

First Symptom	No. of Cases	First Symptom	No. of Cases
Vomiting	24	Dizziness	2
Headache	20	Signs and symptoms of diabetes insipidus	2
Cerebellar ataxia and difficulty with gait	14	"Not feeling well"	2
Nuchal rigidity	9	Drowsiness	2
Convulsion	5	Enlarging head	3
EOM palsy *	4	Fever	2
Developmental arrest	5	Personality change	1
Weakness in extremities	3	Spots before eyes	1
Loss of vision	3	Rapid growth (eosinophilic adenoma)	1
Exophthalmos	3		

* Palsy of extraocular muscles.

With this introduction we pass to the statistical phase of the paper, with attention mainly given to those features of interest to the practicing physician.

ANALYSIS OF CASES

The hospital records disclose that 104 children with expanding intracranial lesions due to localized tumefaction have been admitted to the Denver Children's Hospital during the 22-year period ending July 1, 1951. Cases in which an admission diagnosis of "brain tumor" was not subsequently supported by further study, or was later replaced by another diagnosis, and cases in which the parents did not consent to investigative procedures, removing their child from the hospital before sufficient evidence could be accumulated to support or nullify the diagnosis, are not included in this paper. Of the 104 cases, 90 were proved histologically, and only these were included in this statistical analysis. In 9 of the excluded cases there were histories and clinical findings that were typical of those produced by rapidly growing intracranial lesions but were not histologically confirmed. In some of these, x-ray therapy was carried out without biopsy and with subsequent improvement of the patient. Most of these patients have died with terminal courses in keeping with the provisional diagnosis. In at least three of these 14 cases the histologic sections have been removed from the files and the cases are therefore not included. In two more, the tumors were directly observed at surgery but were inoperable and were not subjected to biopsy.

Age, Sex, and Location.—All the patients studied were less than 15 years of age. Fifty-five were males, and 35 were females. Forty-five of the lesions were infratentorially situated, 38 were in a supratentorial position, and 7 extended into both regions. Three of the latter were sarcomas of the leptomeninges, and there was one each of an ependymoma, spongioblastoma polare, metastatic sarcoma from the tonsillar area, and multiple tuberculomas.

Tumor Types.—Forty-nine of the 90 expanding intracranial lesions were gliomas. The ependymoma group, with 11 ependymomas and four ependymoblastomas was the most frequently seen tumor group. There were 11 medulloblastomas and eight astrocytomas. Seven cases of spongioblastoma polare and five of glioblastoma multiforme were encountered. There were smaller numbers of the other gliomas. No case of oligodendroglioma was seen in this series. Thirty-seven of the gliomas were infratentorially situated, and 10 were in a supratentorial locus. One spongioblastoma polare and one ependymoma extended into infratentorial and supratentorial areas. We can thus concur with Bailey, Buchanan, Bucy, Cushing, and many others that gliomas in children occur far more frequently below the tentorium cerebelli than above, but at the same time we wish to emphasize that, when one considers all the different types of expanding intracranial lesions that the clinician encounters in children, the infratentorial location, at least in our series, is not nearly so favored.

Symptoms.—When attention was turned to symptomatology, it was at once apparent that multiple rather than single symptoms were offered as the chief presenting complaints. Vomiting and headache were most often recorded as the first disturbances and were still prominent as the presenting complaints, although paralyses and weakness of muscles of the face and extremities and diminished vision were frequently given as immediate causes for seeking hospitalization. Table 1 lists the symptoms of onset.

The total symptoms elicited in each history were tabulated, and vomiting was by far the commonest symptom noted. The character of the vomiting was carefully inquired into, and only infrequently was it described as being "projectile." Headache, paralyses, and disturbances in gait or difficulty in maintaining balance were also frequently related in the history. The character and location of the headache varied so widely that it seldom had localizing significance. Convulsions were notable for their infrequency, and when observed were as often misleading with reference to the site of the lesion. The low incidence of nausea and anorexia (even though the vomiting was usually not projectile) is reflected in the fact that only eight patients gave a history of weight

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sions in childhood solely on the basis of gliomas or other limited tumor categories. The differential diagnosis encompasses a wide field, and the prognosis must always be guarded. Every means at the disposal of the clinician for making an accurate preoperative diagnosis should be employed. The assumed added risk occasioned by ventriculography should be re-evaluated. Such a valuable measure is, in our experience, less hazardous than "exploratory craniotomy." The age incidence, the sex of the patient, and the spinal fluid findings cannot be relied on for significant aid in determining the location or the histologic type of the lesion. That infratentorial lesions, especially of the glioma group, are commoner than supratentorial lesions has again been borne out, but as is demonstrated in our material there is little justification for leaning resolutely on this as a diagnostic aid.

A NEW HAZARD IN CERVICAL LAMINECTOMY

Frederick A. Fender, M.D., San Francisco

Laminectomy for correction of intraspinal lesions at the cervical level long has been considered a relatively safe procedure. Recently, however, I have heard of several instances in which there was postoperative evidence of grave injury to the spinal cord following operations for herniation of a portion of an intervertebral disk in the cervical spine. It was not until three dissimilar cases came to my personal attention that I realized there might be a common denominator responsible for the difficulty quite apart from the operative procedure.

REPORT OF CASES

CASE 1.—The patient, whom I attended, was a 72-year-old retired contractor who fell downstairs Oct. 4, 1949, and sustained an anterior dislocation of the sixth cervical vertebra on the seventh. This resulted in pain and disabling weakness of each upper extremity. But there was no motor or sensory disturbance in the lower extremities. The patient was able to walk *perfectly well*, though unable to manage his upper extremities usefully. He was transferred to Stanford University Hospital on Oct. 13. Manipulative attempts to reduce the dislocation were made on several occasions. Crutchfield tongs were employed for traction. The use of 35 lb. "pull," plus additional manual traction and manipulation, with traction in effect, failed to correct the dislocation. These maneuvers did not change the neurological state.

On Oct. 19, operative reduction was performed. Intratracheal ether was used. It was possible to effect reduction without even coming close to the spinal canal. The inferior edge of the sixth lamina, on the right side, was gently scooped away, using a fine gouge. Thereafter, it was possible to introduce a staphylorrhaphy between the laminas. With very little force of leverage, I was able to restore the normal relationship of the facets smoothly. An orthopedic colleague then carried out fixation, wiring together with stainless steel the spinous processes of the fifth, sixth, and seventh vertebrae. Total paraplegia was recognized as soon as the patient emerged from anesthesia. Some motor power remained in the upper extremities, but these, also, were further weakened as compared with the preoperative state. Virtual quadriplegia had resulted. A sensory level could be recognized at the lower limit of the sixth cervical dermatome.

On Oct. 29, after a nursing procedure in which the patient was simply rolled from the supine position to his side, with one axis maintained, respirations ceased, and the patient died. Postmortem examination showed a massive herniation into the spinal canal of the disk between the sixth and seventh cervical segments.

CASE 2.—A 44-year-old housewife registered in Stanford-Lane Outpatient Clinic on Aug. 22, 1951. The history was characterized by accounts of involuntary spastic contractions of each lower extremity, "cold feeling" in the right lower extremity, stumbling and falling, and incontinence of urine and feces. The patient's difficulties had begun with an automobile accident that occurred in 1936, which had resulted in continued "trouble" with her neck. Eventually, because of stiffness of the neck and pain in the right upper extremity, she sought advice in another city. Preoperative neurological findings were "diminished sensation" of the right index and third fingers, suppression of the right biceps reflex, and absence of the right triceps reflex.

With a diagnosis of herniation of a portion of a cervical intervertebral disk, operation was performed in this neighboring city in September, 1949. Under intratracheal anesthesia, the fifth and sixth cervical interspaces were explored on the right side. The approach was made with the use of a drill, so that there was no recognized trauma to the cord; the spinal cord was not approached, nor were the roots disturbed. No pathological change was found in the fifth interspace, but in the sixth the root was found to be encroached on from below by a mass typical of herniated "disk" material. A portion of this material was removed.

The patient awakened with complete quadriplegia. There was gradual improvement, so that five or six days after operation she could move some muscles of the right upper extremity. In succeeding months further improvement followed. She was able to walk without assistance three or four months after operation. Incontinence, left-sided weakness, and the paresthesias persisted. Findings at the time of her clinic visit in San Francisco were spasticity and weakness of the left upper and lower extremities, a Babinski response on the left, a positive Hoffman response on the left, and well-sustained left ankle clonus. The gait was a hemiplegic shuffle.

CASE 3.—A 26-year-old laborer, previously well, was in a head-on automobile collision on April 9, 1950. He sustained a fracture of the second cervical vertebra. He was placed in a nearby hospital in San Francisco, and traction was applied to the head. The only neurological finding was "numbness" of the right forearm in the distribution of the first thoracic dermatome. He was discharged, wearing a cast, on May 29.

From some early period the patient noted, after the application of his cast, a "buzzing sound" coincident with the heart beat, in the left ear. In spite of this he was able to continue with hard work. In March or April, 1951, bulging was noted in the "left superior neck or suboccipital area"; accordingly, the patient was readmitted for study June 19. During this period of hospitalization, left internal and external carotid arteriograms, a right common carotid arteriogram, and a left vertebral arteriogram were made. These were interpreted as showing an arteriovenous fistula at the level of the second and third cervical segments, involving the vertebral artery.

A consultant suggested right vertebral arteriography in order to be sure of the patency of this vessel before the fistula was dealt with. A 30-day period of waiting was suggested, and the patient was discharged July 14. His only complaints at this time were stiffness and dull pain in the left portion of the superior portion of the neck. While the patient was out of the hospital, between July 14 and Aug. 29, he continued hard labor.

The patient was readmitted Aug. 29. Operation preliminary to right vertebral arteriography was done on Aug. 31. Intra-

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tracheal anesthesia was used, and the anesthetist noted that the patient was "tubed with difficulty due to a floppy, formless epiglottis." Arteriography was attempted but not carried out. In the course of the attempt there was hemorrhage from the subclavian artery, and a rather wide exposure, involving removal of part of the right clavicle, was necessary. On awakening, the patient could move his neck, to some extent the trapezii; and to an even slighter extent the left arm. His state amounted to quadriplegia. His breathing was diaphragmatic. Paradoxical respiration was noted. At the time of this writing, two weeks after operation, there had been no improvement. Lumbar puncture postoperatively showed impaired dynamics, whereas there had been free communication before operation.

COMMENT

In cases 1 and 2 the operative work was carried out with the patient's neck in flexion. Operators worked delicately. They were aware of the recognized hazards. They sought to avoid, and did avoid, as far as they knew, any direct injury to the cord. In the third case the cervical portion of the spine was not even operated on, so that there was no possibility of direct operative injury to the spinal cord. Yet the result was much the same in each instance. It is my feeling that there may have been a common injurious factor not related to the operation itself. It may be noted that in each case an intratracheal tube was introduced. It is my belief that extension or other manipulation of the neck incident to introduction of the intratracheal tube may have caused massive herniation of the already damaged intervertebral disk into the spinal canal. Reference to the anatomy of the region and to the pathological groundwork provided by injury strengthens this belief. Accordingly, if intubation in such cases is deemed indispensable, it is recommended that the anesthesiologist be aware of the danger and that he proceed with all the restraint and skill at his command.

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LEPTOSPIRAL MENINGITIS

REPORT OF OUTBREAK AMONG AMERICAN TROOPS ON OKINAWA

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Although leptospiral meningitis has been recognized for many years,[1] it is only recently that the importance of leptospiral infection as an etiological factor in central nervous system disease has received attention in this country.[2] Numerous cases of meningitis in both icteric and nonicteric cases of leptospirosis have been reported in the foreign literature, and some workers have described muscular weakness and transient paralysis, usually involving the lower extremities, associated with leptospirosis.[3] In the United States, it has been customary to assume that patients who present the clinical picture of aseptic meningitis have virus infections; however, in a serologic survey, Beeson [2] was able to show that 11 of 86 undiagnosed cases of aseptic meningitis were caused by leptospiral infection. Schaeffer [4] has described a waterborne epidemic of leptospiral meningitis in which none of the patients had icterus. The purpose of this article is to draw attention to these meningitic manifestations of leptospirosis and to describe an outbreak of central nervous system disease due to Leptospira hebdomadis B among U. S. troops on Okinawa in the summer of 1949.

EPIDEMIOLOGY

Leptospirosis was only briefly considered as a possibility at the time these cases occurred, and the investigation that was made sometime later did not include certain pertinent data. Of 19 patients with central nervous system disease hospitalized at the 34th General Hospital, Okinawa, in August and September, 16 were shown by serologic methods to have leptospiral infection. The distribution of cases by unit and date of onset is shown in table 1. It is of interest that the three patients with cases for which the cause was not determined were from a unit located in a different area of the island than that of the patients known to have leptospiral infection. Ten patients with proved cases were from the 58th Ordnance Ammunition Company, and investigation revealed that all had been swimming almost daily in an "off-limits" pond about two miles from their quarters, as had the patients from the 504th Ordnance Supply Platoon. Two other patients had been stationed at the Okinawa Rest Center. They had been in a jeep accident on Sept. 1, in which they were trapped in a rice paddy for a short time and swallowed some paddy water. The incubation period in these two cases was 10 and 11 days, respectively. No recorded data are available on the probable source of infection for the other four patients, although there is strong reason to believe they engaged in the unauthorized swimming mentioned previously.

SYMPTOMS

The disease in this group was characterized by sudden onset, with headache, fever, and nuchal rigidity. When hospitalized on the third or fourth day of illness, all patients had temperatures ranging from 102 to 104 F and

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[1] Troisier, J., and Boquien, Y.: La spirochétose méningée, Paris, *Masson et Cie,* 1933.

[2] Beeson, P. B., and Hankey, D. D.: "Benign Aseptic Meningitis" As a Manifestation of Leptospiral Infection, Tr. A. Am. Physicians **63**: 130, 1950.

[3] (*a*) Buzzard, E. M., and Wylie, J. A. H.: Meningitis Leptospirosa, Lancet **2**: 417, 1947. (*b*) Van Thiel, P. H.: The Leptospirosis, Leiden, Universitaire Pers Leiden, 1948.

[4] Schaeffer, M.: Leptospiral Meningitis, Investigation of Water-Borne Epidemic Due to L. Pomona, abstracted, J. Clin. Investigation **30**: 670, 1951.

conjunctival congestion. In most cases, the fever lasted 6 to 8 days and was followed by a remission lasting 24 to 48 hours and a secondary febrile period, during which the patients' temperatures ranged between 100 and 102 F for 36 to 72 hours. During the period of secondary fever, the meningitic signs recurred. Nuchal rigidity was present in almost all patients when admitted to the hospital, in some to a considerable degree, lasting two to seven days. All patients complained of severe headache and backache, and a few had nausea, vomiting, and diarrhea. During the initial febrile period, seven patients had muscular weakness, usually of the hamstrings and quadriceps; one had twitching of the muscles of the upper extremities and of the pectoral muscles, and another was disoriented. The severest neurological signs occurred in the patient in case 1 described below. There were no deaths. Residual paralysis occurred only in the patient described in case 1, who still had muscular weakness when evacuated to the zone of interior after three months' hospitalization. In three cases (9, 10, and 16), liver tenderness was noted, in a fourth (3) laboratory evidence indicated liver involvement, and in a fifth (11) what was considered to be infectious hepatitis developed 40 days after the onset of the disease.

TABLE 1.—*Distribution of Cases of Leptospiral Meningitis by Date of Onset and Unit of Patient*

Unit	Onset, Date	Case No.	Diagnosis Confirmed
58th Ordnance Bn................	8/ 5/49	1	Yes
	8/14/49	2	Yes
	8/25/49	3	Yes
	8/28/49	4 and 5	Yes
	8/29/49	6	Yes
	8/31/49	7 and 8	Yes
	9/ 3/49	13 and 14	Yes
87th Ordnance Bn................	9/ 2/49	10	No
	9/ 6/49	15	No
	9/ 9/49	16	No
Okinawa Rest Center............	9/11/49	17	Yes
	9/12/49	18	Yes
29th Infantry Bn..................	9/ 2/49	12	Yes
	9/14/49	19	Yes
Unknown	8/31/49	9	Yes
	9/ 2/49	11	Yes

Laboratory Data.—White blood cell counts for the patients ranged from 4,400 to 11,500, with a mean of 8,000, the differential count showing usually less than 80% polymorphonuclears. One patient had eosinophilia due to parasitic infestation. The spinal fluid in all patients was normal on admission, but pleocytosis, with a cell count of 50 to 300 cells, mostly lymphocytes, appeared in all during the secondary rise in temperature. Spinal fluid sugar levels were normal, and the protein levels were elevated to a high normal. Chest roentgenograms of 10 patients showed no active pulmonary lesions. All had negative reactions to serologic tests for syphilis and to liver function tests, with the exception of one patient who had a serum bilirubin level of 1.1 mg. per 100 cc. during the febrile phase, which returned to 0.5 mg. per 100 cc. during hospitalization. Six of the patients had transient albuminuria.

Specimens of serum were obtained from each patient and were tested at the 406th Medical General Laboratory in Tokyo and at the Army Medical Service Graduate School, Washington, D. C. At the former laboratory, results of tests for complement fixing antibodies of Japanese encephalitis type B were negative for all specimens, except that drawn on the 63rd day from the patient in case 10, which gave a positive neutralization reaction. In the Department of Virus and Rickettsial Diseases, A. M. S. G. S., neutralization tests were made on selected serum specimens for dengue, encephalomyocarditis, lymphocytic choriomeningitis, Japanese encephalitis type B, eastern and western equine encephalomyelitis, and Russian spring-summer encephalitis. Results of these tests were negative.

TABLE 2.—*Results of Leptospiral Agglutination Tests*

		Leptospira Strain * †			
Case No.	Days of Illness	Icterohemorrhagiae	Hebdomadis A ‡	Hebdomadis B	Autumnalis (Akiyami Type A)
1	10	0	0	400	0
	32	0	0	200	0
	45	0	0	200	0
2	10	0	0	400	0
	23	0	0	1,600	0
	30	0	0	800	0
3	12	0	0	200	0
	19	0	0	400	0
	27	0	0	800	0
	71	0	0	1,600	0
4	16	0	0	400	0
	22	0	0	200	0
5	9	100	0	800	50
	22	0	0	400	0
	66	0	0	6,400	0
6	21	400	0	1,600	0
	58	0	0	800	0
7	6	0	0	0	0
	13	0	0	400	0
	19	0	0	400	0
8	6	0	0	0	0
	13	0	0	100	0
	21	0	0	0	0
	65	0	0	100	0
9	21	0	0	800	0
10	11	0	0	0	0
	19	0	0	0	0
	54	0	0	0	0
	63	0	0	0	0
11	11	0	0	200	0
	19	0	0	1,600	0
	60	0	0	3,200	0
	88	0	0	1,600	0
	103	0	0	800	0
12	11	0	0	800	0
	19	0	0	800	0
13	3	0	0	0	0
	10	50	0	800	0
	16	0	0	800	0
14	10	0	0	1,600	0
	16	0	0	400	0
	53	0	0	800	0
15	7	0	0	0	0
	13	0	0	0	0
	51	0	0	0	0
	60	0	0	0	0
16	10	0	0	0	0
	52	0	0	0	0
17	10	0	0	800	0
	18	50	50	800	0
	87	0	50	1,600	0
	94	0	0	1,600	0
18	7	0	0	200	0
	15	0	200	50	100
19	13	50	800	0	400
	36	200	800	0	800

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* The titers are expressed as the reciprocal of the highest serum dilution in which complete agglutination and/or lysis was observed.

† All serums were also tested for the following Leptospira strains with negative results: canicola, pomona, bovis, bataviae, mitis, okinawa, grippotyphosa, hebdomadis C and zanoni.

‡ The strain listed here as Hebdomadis A has been subsequently shown to be a member of the Lept. autumnalis group and is unrelated antigenically to the Lept. hebdomadis group.

The first indication that these patients might have leptospirosis came when the serum from the patient in case 1 was sent to Dr. Paul Beeson, who was testing serums of patients with undiagnosed central nervous system disease for leptospirosis. Dr. Beeson reported that the convalescent serum of this patient gave a positive agglutination reaction for leptospirosis. Agglutination tests on serums of the remainder of the patients were made by the Veterinary Division, A. M. S. G. S. Thirteen antigenically distinct strains of Leptospira were employed, with five day cultures being used as the live antigens. The serum-antigen mixtures were incubated at 30 C for three hours and then were examined by dark field illumination. The results of these tests are shown in table 2. In this test a titer of 1: 200 is considered to be of diagnostic significance. In 15 of these cases Lept. hebdomadis B was agglutinated but the serum in one of these also agglutinated Lept. hebdomadis A and Lept. autumnalis A (akiyami type A) in comparable titers; in addition, the serum of the patient in case 19 agglutinated Lept. hebdomadis A, Lept. autumnalis A, and Lept. icterohemorrhagiae.

REPORT OF CASES

CASE 1 (table 2).—A 19-year-old white soldier became ill with chills and fever on Aug. 5, 1949. He had gone swimming in an "off-limits" pond near his quarters for the past several months. When admitted to the hospital the following day, his temperature was 103 F, pulse rate 100, and respiratory rate 24. His case was atypical in that he had no headache, conjunctival injection, or nuchal rigidity during the initial episode, and the only other manifestations of illness were an infected throat and increased breath sounds in the right thorax. The fever subsided on the fifth day, and the patient felt well but had some loose stools. On the seventh day, his temperature suddenly rose to 103.8 F, and he had musical rales throughout his chest. The following day he had nuchal rigidity, headache, and conjunctival congestion. He continued to have a low grade fever (99 to 100 F) and experienced weakness of the left quadriceps and spasm of the hamstrings. The weakness and spasm increased, and an intention tremor, bilateral ankle and patellar clonus, and slightly hyperactive deep tendon reflexes developed. Eosinophilia developed, and the patient was found to be infected with Trichuris and Strongyloides stercoralis. On the 48th day he was transferred to the 361st Station Hospital, Japan, at which time he had slight weakness of the abductors of the left arm, flexors of the left wrist, left quadriceps femoris, hamstrings, and abductors of the thigh. He was given penicillin and sulfadiazine during the acute stages; in addition, he was given two courses of hexylresorcinol and one course of tetrachloroethylene for the parasitic infestation and physical therapy and massage for relief of the muscle spasms. The low grade fever continued, but improvement was noted, and on the 87th day the patient was evacuated to the zone of interior.

Laboratory Data.—The patient's white blood cell count on the 2nd day was 6,859 (72% polymorphonuclears), and on the 23rd day it was 8,700 (44% polymorphonuclears and 24% eosinophils). X-ray examination of the chest on the 5th day and of the lumbar region of the spine on the 17th day revealed no abnormalities. The spinal fluid showed 127 cells on the 7th day (75% lymphocytes), and on the 20th day 30 cells (96% lymphocytes). Sugar and total protein levels were normal. A blood culture was negative. A heterophil antibody titer on the 13th day was 1:16, and on the 26th day, 1:14. Neutralization tests for Japanese encephalitis type B done on the 10th, 32nd, and 39th days were negative. Tests for complement fixing antibodies of Japanese encephalitis type B were done on seven occasions between the 10th and 60th days, and all were negative, as were tests for complement fixing antibodies of western equine and St. Louis encephalitis done on the 62nd day. The hemagglutination-inhibition test for mumps was positive (1:64) on the 10th, 32nd, 35th, 45th, and 62nd days, but this was not considered significant. The leptospiral agglutination test was positive for Lept. hebdomadis B on the 10th day, with a titer of 1:400, on the 32nd day, with a titer of 1:200, and on the 45th day, with a titer of 1:200.

CASE 2 (table 2).—An 18-year-old white soldier became ill on Aug. 14, 1949, 19 days after his arrival in Okinawa. He had been swimming in an off-limits pond near his camp. The illness began with an attack of nausea, followed two days later by severe headache, fever, backache, and orbital pain. On admission to the hospital on the third day of his illness, his temperature was 102.4 F, pulse rate 110, and respiratory rate 22. He had questionable nuchal rigidity, conjunctival congestion, shotty lymph nodes, and questionable Babinski and Kernig signs. He had a positive Oppenheim sign, hyperperistalsis, no paralysis or muscle changes, and no jaundice. His temperature remained elevated, and the severe headache, hyperperistalsis, and occasional vomiting continued until the seventh day, when defervescence occurred and the patient felt better. On the following day the headache returned, with definite nuchal rigidity, and his temperature rose to 100 F. On the ninth day, the patient's neck was stiff, a positive Kernig sign was elicited, and he again vomited. At this time there was some tenderness of the calf muscles. On the 10th day, the patient was afebrile and had no notable complaints. His convalescence was uneventful.

During his illness he received no specific therapy; he was given sulfadiazine for the hyperperistalsis.

Laboratory Data.—The white blood cell count on the third day was 10,500 (82% polymorphonuclears) and on the eighth day was 5,600 (70% polymorphonuclears). The spinal fluid showed 2 cells on the 3rd day, 14 cells (85% lymphocytes) on the 5th day, 169 cells (64% lymphocytes) on the 9th day, and 9 cells on the 16th day. Tests for complement fixing and neutralizing antibodies of Japanese encephalitis type B done on the 10th, 23rd, 30th, and 73rd days were negative. Leptospiral agglutination tests were positive for Lept. hebdomadis B on the 10th day, with a titer of 1:200, on the 23rd day, with a titer of 1:1,600 and on the 30th day, with a titer of 1:800.

CASE 18 (table 2).—A 24-year-old white soldier became ill on Sept. 12, 1949. On Sept. 1, he had been in a jeep accident and was thrown into a rice paddy and unavoidably swallowed some of the paddy water. He was admitted to the hospital on the third day of illness and had a temperature of 104 F, a pulse rate of 120, and a respiratory rate of 30, with moderate pharyngeal congestion, conjunctival suffusion, slight nuchal rigidity, and a questionable Kernig sign. His temperature remained between 102 F and 104 F until the sixth day, when it gradually subsided, reaching normal on the eighth day. His temperature rose again on the 10th day to 102 F and remained at this level for 48 hours before final defervescence. During the secondary febrile period there was definite rigidity, the spinal fluid showed pleocytosis, and there was some disorientation. Bilateral musical rales were heard during the initial febrile period, and there was occasional vomiting at that time. The patient was given penicillin from admission until the eighth day. After the 12th day, his improvement was rapid, and he recovered completely.

Laboratory Data.—On the third day the white blood cell count was 7,350 (81% polymorphonuclears). A urinalysis showed no abnormalities, and a blood culture, malaria smears, and a serologic test for syphilis were negative. A chest roentgenogram was normal. A throat culture was positive for beta hemolytic streptococci. Spinal fluid on the 3rd day showed 15 cells (67% lymphocytes), on the 4th day 9 cells (78% lymphocytes), on the 9th day 993 cells (63% lymphocytes), and on the 23rd day 15 cells (93% lymphocytes). The sugar level was normal, and the total protein content was 115 mg. per 100 cc. on the 9th day. Serum specimens drawn on the 7th days and 15th days of illness were negative for complement fixing antibodies of Japanese encephalitis type B. Leptospiral agglutination tests gave the following results: on the 7th day, positive for Lept. hebdomadis B, with a titer of 1:200; on the 15th day, positive for Lept. hebdomadis B, with a titer of 1:50, positive for Lept. hebdomadis A, with a titer of 1:200, and positive for Lept. autumnalis, with a titer of 1:100.

COMMENT

The outbreak we have described serves to emphasize how easily leptospiral infections of the central nervous system can be overlooked. In this group of patients, the common exposure to surface waters led to a brief consideration of leptospirosis, but this was dismissed, and in all the disease was clinically diagnosed as encephalitis of unknown cause. Leptospirosis was not considered again as a possibility until long after these cases had occurred and laboratory tests had eliminated a number of known viral agents as being of etiological significance. None of the patients had icterus, and it was the conjunctival congestion and histories of immersion that suggested leptospirosis.

The specific etiological agent, Lept. hebdomadis B, responsible for these illnesses had not been found in the United States, but it does exist in Japan and Indonesia.[3b] It is classed as one that produces a comparatively mild disease in man. Other leptospiral agents in the United States can and do produce similar diseases.[4] The importance of immersion as a factor in contraction of leptospiral infection has been noted in England and in other European countries.[3a] In the Netherlands, 75% of the cases are believed to occur as a sequel to swimming in or accidental immersion in contaminated canals and waterways.[5] In the cases that occurred in the recent epidemic in Alabama,[4] the infection was acquired during swimming, and this focuses attention on a health hazard largely unrecognized in the United States. In Northern Italy, the infection is usually acquired in the rice fields, in which the laborers work in water during the planting season. Mino[6] has noted that the greatest danger of clinical illness occurs during the initial season spent in the fields. Cases are rare among those who have worked in the fields for more than one season, and this finding suggests an immunization process through inapparent infections. The soldiers affected in this outbreak may be likened to the workers during their first season in the Italian rice fields. Unfortunately, no serum specimens were collected from men who had gone swimming in the off-limits pond who did not become ill; hence, it was not possible to demonstrate the acquisition of specific antibodies acquired without apparent clinical disease. It is possible that other outbreaks of obscure central nervous system disease that occurred among American troops in the Asiatic-Pacific area during World War II may have been of leptospiral origin. Such outbreaks of undetermined cause are being reviewed, and serum specimens that are still available in the files of the Army Medical Service Graduate School will be tested for Leptospira.

SUMMARY

An outbreak of central nervous system disease due to infection with Leptospira hebdomadis B among American troops on Okinawa is described. The clinical and laboratory findings are presented, and the epidemiology is discussed.

[5] Walch-Sorgdrager, B.: Leptospiroses, Bull. Health Organ, League of Nations 8: 143, 1939.

[6] Mino, P.: Weitere Untersuchungen über die Leptospirose der Reisfeldarbeiter (Feldmause als Leptospirenträger), München. med. Wchnschr. 88: 96, 1941.

APLASTIC ANEMIA FOLLOWING PROLONGED ADMINISTRATION OF CHLORAMPHENICOL

A REPORT OF TWO CASES, ONE A FATALITY

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Following prolonged administration of chloramphenicol, two cases of aplastic anemia, one of which ended fatally, were encountered. In a study to be reported elsewhere by one of us (M. S. H.), on the effects of chloramphenicol in the bacteriostatic control of chronic bronchopulmonary suppuration, 62 patients, ranging in age from 1 year to 72 years, were given the drug over periods of from 1 month to 14 months. Dosages of 1 gm., two to three times weekly and, in a few instances, daily, were administered after an initial period of more intensive antibiotic therapy, which included penicillin and/or streptomycin. Thus, in a controlled series, 2 of 62 patients receiving the drug for long periods had severe hematological complications. In the two cases of aplastic anemia to be reported, the first of which ended fatally, the drug was given for approximately seven months and five and one-half months, respectively.

REPORT OF CASES

Case 1.—A 39-year-old white waitress was admitted to the Los Angeles County Hospital on March 1, 1951, with the chief complaint of coughing up approximately one-half cup of blood on the night before admission. She stated further that two weeks prior to this she had noticed dark red clots of blood on her upper gum and on her tongue. Subsequent to this she had a rash on her arms, legs, and trunk. There was no history of chills, hematuria, or melena. She had a known history of bronchiectasis for 13 years and was treated with aerosol sulfadiazine from August, 1944, to November, 1945, and aerosol penicillin from November, 1945, to July, 1947, and from November, 1949, to August, 1950. During the time she was treated with sulfadiazine she was followed with weekly blood cell counts, none of which was reported as abnormal. On Aug. 18, 1950, to control the symptoms of bronchiectasis, she was given 1 gm. of chloramphenicol twice weekly and was maintained on this dosage until Feb. 24, 1951. During this time she presumably took potassium iodide in unknown amounts at unknown intervals. On Jan. 23, 1951, she entered the allergy clinic complaining of nosebleeds and hay fever. She was given tripelennamine (pyribenzamine®) hydrochloride, of which she took only four tablets, elixir of terpin hydrate with codeine, and phenylephrine (neo-synephrine®) hydrochloride nose drops, the latter two on single prescriptions. There was no history of exposure to any known toxic substance, and the only drugs taken by her were those listed.

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Physical examination on admission revealed a well-developed, poorly nourished young woman in no acute distress. There were numerous pinpoint to 1 mm. sized purpuric spots on her legs, arms, and trunk. Crusted blood adhered to her nostrils, and several dark red clots clung to her gum margins. A few petechiae were seen on the hard palate. Blood pressure was 130/80, pulse 90, and temperature 103 F (rectal). The remainder of the physical examination was not remarkable. The erythrocyte count on admission was 1,720,000 and hemoglobin, 6.0 gm. The leukocyte count was 1,110, with 8% neutrophils and 92% lymphocytes. The urine showed a specific gravity of 1.012, with no albumin, no sugar, and a few granular casts. After two transfusions the hemoglobin was 9.6 gm., with 3,000,000 erythrocytes; the leukocyte count was 1,450, with 2% neutrophils, 97% lymphocytes, and 1% eosinophils. There were 15,000 thrombocytes. Prothrombin time was 100% of normal; serum albumin was 4.4 gm. and globulin 3.2 gm. Her aspirated bone marrow was hypocellular with a majority of cells being plasmacytes, lymphocytes, and reticulum cells.

On the second hospital day uncontrollable epistaxis started, which was followed on the next day by hematuria and gross melena. The patient's temperature became elevated in spite of antibiotic therapy. Treatment consisted of administration of penicillin, aureomycin, streptomycin, ferrous sulfate, vitamin K, crude liver extract, vitamin B_{12}, choline, and folic acid. She rereceived a total of 4,000 cc. of whole blood. She gradually became weaker; her temperature rose to 105 F on March 12, and she died on March 13, 1951.

TABLE 1.—*Blood Studies of Patient in Case 2*

Date of Study	Red Blood Cells	Hemoglobin, Gm./100 Cc.	White Blood Cells	Polymorphonuclears	Band Forms	Eosinophils	Lymphocytes	Monocytes	Platelets
3/ 7/51	2,500,000	8.5	6,400	30.5	6	6.5	57.5	5	67,500
3/10/51	2,480,000	8.2	6,100	32	5	3	64	1	62,000
3/13/51 *	3,630,000	10.6	4,000	26	4	2	67	5	101,640

* *After 1,000 cc. transfusion.*

At necropsy the following significant observations were recorded: a large subdural hematoma measuring approximately 100 cc.; numerous petechial hemorrhages throughout cerebrum, cerebellum, and brain stem; petechial hemorrhages over visceral pericardium and scattered throughout the myocardium; a 250 cc. hematoma within the stomach; scattered petechial hemorrhages throughout the gastrointestinal mucosa; dark red blood in both renal pelves, and scattered petechial hemorrhages throughout the kidney parenchyma; pale yellowish-red soft bone marrow in sternum, vertebrae, and femur; emphysema of the upper portions of both lungs and fusiform dilatation, extending peripherally, of the bronchi leading to both lower lobes. Scattered areas of consolidation were present in both lungs. Bone marrow section, which was severely hypoplastic, showed an almost complete absence of normal marrow cells. The marrow contained some lymphocytes and an increase in the number of plasma cells.

Thus, in this patient, while taking chloramphenicol for approximately seven months at a dosage of 1 gm. twice weekly, pancytopenia and aplastic bone marrow developed and caused death. If the nosebleed reported in January represented the thrombocytopenia later demonstrated, then the symptoms may be said to have started approximately five months after chloramphenicol therapy was started; otherwise, the unquestioned manifestations of her final illness were noted one month later.

CASE 2.—A woman, aged 37, had a right pneumothorax for active tuberculosis from 1939 to 1943. Despite clinical recovery, the cough and mucopurulent sputum, which had antedated the tuberculous infection, did not regress. In February, 1950, she was raising 75 cc. of sputum per 24 hours. Bronchoscopy disclosed bronchiectasis in the left lower lobe. On Aug. 15, 1950, after a week of penicillin and streptomycin therapy, chloramphenicol therapy was begun in a dosage of 1 gm. two times weekly for six and one-half months. The volume of sputum was promptly reduced with this treatment to 15 cc. per 24 hour period, at which level it remained. Early in December, 1950, the leukocyte count and hematocrit were reported as normal. The patient failed to return for observation until March 5, 1951. On this date the following history was obtained.

Three months following the start of chloramphenicol therapy listlessness developed, and the patient experienced severe epistaxis. Two months later, five months after the onset of this therapy, a second heavy nosebleed was experienced. The two menstrual periods prior to March 5, 1951, were said to have been unusually heavy. From Feb. 22, 1951, unusually heavy "bruising" of the skin was noted. Careful questioning failed to reveal any other drugs had been taken in significant amounts.

On March 6, 1951, the patient was admitted to Cedars of Lebanon Hospital. Significant findings at this time were pallor and ecchymoses over the right thigh and left forearm. On April 27 the patient was given 200 mg. of cortisone intramuscularly, followed by a daily oral dose of 50 mg. On May 3, 1951, the blood cell count was as follows: hemoglobin, 10.0 gm.; red blood cells, 3,340,000; white blood cells, 9,800, with 33% polymorphonuclears, 60% lymphocytes, 4% eosinophils, and 3% monocytes. The platelet count was 9,000, and the reticulocytes had risen to 3.6%.

Here, then, is a case of a patient in whom a bleeding tendency developed, as indicated first by a nosebleed, three months after she began receiving 1 gm. of chloramphenicol two times weekly to control the manifestations of bronchiectasis. A second heavy nosebleed and profuseness of the menses also developed. The first adequate blood studies, made approximately one week after the last dose of chloramphenicol, demonstrated anemia and depression of polymorphs and thrombocytes. Subsequent blood cell counts showed little alteration, up to approximately two months following the cessation of chloramphenicol therapy. Two studies of aspirated bone marrow showed a persistently hypoplastic marrow. As stated, the bronchiectatic manifestations were well controlled, and no drug other than chloramphenicol was taken in any significant amount. From the course to date, it seems probable that the bone marrow depression will persist for some time. The prothrombin concentration was 87% of normal. The thymol turbidity was 3.7 units, and the reticulocyte percentage was 1.1%. The bone marrow was hypoplastic, with cell count on smear of aspirated marrow of 21,800 per cubic millimeter. The distribution of cells was: polymorphonuclears 27%, metamyelocytes 5%, myelocytes 2%, eosinophils 7%, lymphocytes (small) 28%, and normoblasts (all with pyknotic nuclei) 31%. An unusually large number of lymphocytes and eosinophils were seen. No megakaryocytes were noted.

During the course of the next two months, without any therapy, the blood cell counts (five) remained essentially unchanged. The white cell count ranged between 4,000 and 8,000, with between 26% and 33% polymorphs. The platelet counts ranged between 20,000 and 34,000. The reticulocytes were 1.1% to 1.4%. On April 5, 1951, a second bone marrow study was identical with the initial study.

COMMENT

The occurrence of an adverse episode, such as bone marrow depression or destruction, in the course of treatment of a disease with a new drug does not, of itself, prove the drug to be the cause of the untoward reaction. To be considered are the possibilities that the reaction in question was a spontaneous one of unknown etiology or that it occurred as a manifestation of the original disease being treated, or, possibly, that it was an expression of an intercurrent disease, not originally recognized. When more than one drug is being administered, question may arise as to which one is at fault, if any are to blame. When a spontaneous ill-effect, such as primary aplastic anemia, is a rare occurrence, when the disease being treated almost never excites the changes under consideration, and when no intercurrent disease that might cause the adverse response can be demonstrated, then the drugs being used must be carefully considered as the causal agents.

Certain drugs, which, through experience, are known as unlikely to cause the adverse response in question, are not usually seriously considered as causal agents. Also, if the quantity of a drug being given is extremely small or its last administration extremely remote in time, this drug is also not likely to be condemned. On the other hand, when in the course of treatment of a disease with a relatively new drug an untoward reaction occurs and other circumstances connected with the case seem unlikely as precipitating agents, then the new substance falls under suspicion, which grows stronger as clinical experience and investigative work in the hands of others turns up similar reactions with the same agent.

In the two cases reported here, chloramphenicol seems likely to have been the cause of the hematopoietic changes described. Both patients had bronchiectasis, fundamentally an infectious process, which almost never excites serious depression of the hematopoietic organs. Before the onset of the untoward episode no involvement of the myelogenous tissue was apparent. No intercurrent disease entity was found that one might possibly incriminate as the offending factor. These patients, furthermore, had taken almost no medication, aside from chloramphenicol, that was at all likely to have created the pancytopenia. Hence, on the basis of the criteria above stated and the clinical data in these cases, chloramphenicol falls under strong suspicion of having been the cause of the bone marrow depression.

Table 2.—*Cases of Bone Marrow Depression Associated with Chloramphenicol Administration*

Author	Age of Patient	Sex	Disease Under Treatment	Duration of Administration (Approximation)	Total Amount Given, Gm. (Approximation)	First Sign of Ill-Effect	Duration of Treatment on Appearance of First Sign	Ultimate Result
Gill [4]	13 mo.	F	Salmonella dysentery	12 days	6.3	Granulocytopenia	....	Prompt recovery
Gill [4]	4 mo.	M	Salmonella dysentery	2 days	1.75	Granulocytopenia	2 days	Prompt recovery
Volini [5]	11 yr.	M	Typhoid	18 days	53	Granulocytopenia, anemia	2 days	Recovery after 22 days
Volini [5]	41 yr.	M	Brucellosis	19 days	53	Neutropenia	....	Prompt recovery
Volini [5]	14 yr.	M	Typhoid amebiasis	9 days	26	Neutropenia	....	Prompt recovery
Rich [6]	63 yr.	M	Chronic urinary tract infection	12 weeks	57	Purpura	12 weeks	Death
This report, case 1	39 yr.	F	Chronic bronchiectasis	28 weeks	56	Purpura	26 weeks	Death
This report, case 2	37 yr.	F	Chronic bronchiectasis	26 weeks	52	Lack of energy, epistaxis	13 weeks	Depression of marrow elements continued over four months after last dose of chloramphenicol

From the research laboratory and clinic little evidence has been gathered that would tend to incriminate chloramphenicol as a drug likely to cause bone marrow depression. Smith and co-workers[1] induced a drop in hemoglobin and red blood cell count in three dogs that received chloramphenicol in propylene glycol intramuscularly, twice daily, five days a week for a total of 38 doses. Each dog received 72 to 88 mg. per kilogram of body weight daily. When the drug was administered orally no such reaction occurred. Smadel[2] called attention to the nitrobenzene radical in chloramphenicol and its possible toxic effect on the hematopoietic system. Kracke and Parker[3] early called attention to the possibility of drugs containing the benzene ring with an attached amine or nitroradical causing bone marrow depression in susceptible persons. Chloramphenicol is such a chemical; however, in a broad experience in the use of chloramphenicol, neither Smadel[2] nor most other investigators have reported serious side-effects from the use of this drug (table 2).

The reported instances of bone marrow depression in patients in which chloramphenicol was the suspected agent are few. Gill[4] reported two cases of infants treated for acute salmonellosis with chloramphenicol in whom a marked drop in granulocytes developed within a short space of time. With the discontinuance of this drug there was a prompt return of the granulocytes to a normal level. The first of these two patients had been under treatment for erythredema by various measures. A subsequent return to these measures caused no recurrence of the agranulocytosis. The second patient had had no other drug than chloramphenicol.

Volini and associates[5] reported two patients treated for typhoid and one for brucellosis in whom leukopenia, granulocytopenia, and, in one of the patients, severe anemia developed. These patients had been under treatment with chloramphenicol for from 7 to 19 days when the blood changes were noted. The drug had been therapeutically effective. Associated with the neutropenia was the bone marrow picture of a quantitative decrease in granulocytopoietic tissue with maturation arrest of granulopoiesis. The one patient with the severe anemia showed an additional and similar arrest in the erythroid series. In none of these patients were megakaryocytes or platelets altered. All of these patients responded promptly to a cessation of the drug and to supportive measures.

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[1] Smith, R. M., and others: Chloromycetin: Biological Studies, J. Bact. **55**: 425, 1948.

[2] Smadel, J. E.: Chloramphenicol (Chloromycetin) in Treatment of Infectious Diseases, Am. J. Med. **7**: 671, 1949.

[3] Kracke, R. R., and Parker, F. P.: Etiology of Granulopenia (Agranulocytosis), with Particular Reference to Drugs Containing Benzene Ring, J. Lab. & Clin. Med. **19**: 799, 1934.

[4] Gill, P. F.: Agranulocytopenia Following "Chloromycetin": Report on Two Cases, M. J. Australia **1**: 768, 1950.

[5] Volini, I. F., and others: Hemopoietic Changes During Administration of Chloramphenicol (Chloromycetin), J. A. M. A. **142**: 1333 (April 29) 1950.

[6] Rich, M. L.; Ritterhoff, R. J., and Hoffman, R. J.: Fatal Case of Aplastic Anemia Following Chloramphenicol (Chloromycetin) Therapy, Ann. Int. Med. **33**: 1459, 1950.

Rich, Ritterhoff, and Hoffman[6] reported a fatal case of aplastic anemia following chloramphenicol therapy over a period of three months for a urinary tract infection. This treatment was continued until purpura was noted. At autopsy, in addition to aplasia of the bone marrow, an extremely early small carcinoma of the stomach and a mild chronic pyelonephritis were found. It does not seem likely that the incidental pathology noted contributed to the bone marrow changes. In all of these cases and in our own two cases, the preponderance of evidence seems to indicate that chloramphenicol is the noxious agent in the development of myeloid depression.

Several questions may be raised in regard to the likelihood of the occurrence of such untoward incidents as herein recorded. Does length of treatment play a factor? Is total dosage of importance? Our two patients received chloramphenicol in 1 gm. doses twice weekly for approximately 26 and 28 weeks respectively, thus having received a total of 52 and 56 gm. when the first signs of bleeding developed. As stated above, our two patients were members of a group of bronchiectatic patients who were receiving 1 gm. of chloramphenicol for the most part, two or three times to, in a few instances, seven times weekly, for from 1 to 14 months. The occurrence of this ill-effect in 2 patients out of a total of 62 treated according to a similar program constitutes a relatively high incidence and further suggests that prolonged administration may be a predisposing factor. In the fatal case of Rich and associates,[6] the patient also received the drug over approximately 15 weeks (a total dosage of approximately 57 gm.). The five other patients from the literature herein mentioned received the drug for shorter periods. Thus, in the two fatal cases of the seven here described chloramphenicol was given over a longer period of time. The doses often did not exceed those of the patients who survived (table 2).

In the cases of Volini and his associates,[5] the total amount given was a sizable quantity. In Gill's[4] cases the duration of therapy was short but the dose fairly large, considering the ages of the patients. Certainly, with such a small group of patients, no definite conclusions can be drawn as to the questions raised. No doubt, the element of individual susceptibility is a large factor here as in other drug sensitivities, and one may expect that, if sensitization occurs in some patients after long treatment, it will occur in others in short courses of therapy.

Considering the observations herein recorded and referred to, it seems advisable to keep in mind the possibility of an untoward reaction of the nature described occurring during the course of chloramphenicol therapy and to look for the signs of such a reaction. The question then arises as to what one should look for as the signs of involvement of the myeloid elements. The clinical evidences, such as purpuric manifestations resulting from thrombocytopenia or secondary rise in temperature as a result of bacterial invasion in the wake of granulocytopenia, are signs that occur late in the course of marrow depression and are signals of very grave danger. So far, experience with chloramphenicol is too limited to know what manifestations in the peripheral blood one might expect to find early, when bone marrow toxicity occurs. If one can infer from the changes that take place in the course of the administration of benzene, a related compound that has been more thoroughly studied and has been observed to depress the myeloid elements, then we might expect to find the following expressions in the peripheral blood[7]: (1) early evidences of stimulation of various myeloid elements, such as a rise in the red blood cell count or an unexplainable increase in leukocytes; (2) increase in eosinophils; (3) reduction in granulocytes; (4) reduction in thrombocytes; and (5) decrease in erythrocytes. These manifestations may vary from one person to the next; thus, one patient may show a predominant effect in the granulocytic cells and another in the erythroid or thrombocytic elements.

The evidence so far presented in regard to these serious effects of the use of chloramphenicol are in themselves not enough to condemn a drug proved of such great value, and one that has been used in tens of thousands of patients without ill-effect; however, at present, certain precautions seem definitely indicated during the administration of chloramphenicol. Blood cell counts, which include studies of the stained smears, should be performed at least twice weekly. A reduction in granulocytes, erythrocytes, or thrombocytes below the normal level should certainly warrant discontinuance of the drug and further follow-up observations. Unexplained increases in the leukocytes, erythrocytes, and eosinophils should put one on guard. Study of the bone marrow would be of interest, but it is not feasible for ordinary practice. Besides, if we can reason by analogy from the effect of other drugs that depress the bone marrow, early changes in the bone marrow, before distinctive changes occur in the peripheral blood, are not apt to be diagnostic. The occurrence of the unfortunate incidents herein described or referred to warrants a renewal of the investigation of chloramphenicol from the point of view of its hematological effect.

SUMMARY

Two cases of aplastic anemia, one of them fatal, occurring in the course of chloramphenicol administration are described. Five other instances of untoward hematological effect, seemingly the result of chloramphenicol administration, are described. Certain precautions to be taken when the drug is administered are recommended. Further observation on the hematological effect of chloramphenicol are suggested.

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[7] Hamilton, A.: Benzene (Benzol) Poisoning, Arch. Path. **11**:434 (March) 1931; ibid. **11**:601 (April) 1931.

Science Versus Art.—I am well aware that in these days, when a student must be converted into a physiologist, a physicist, a chemist, a biologist, a pharmacologist, and an electrician, there is not time to make a physician of him. That consummation can only come after he has gone out in the world of sickness and suffering, unless indeed his mind is so bemused, his instincts so dulled, his sympathy so blunted by the long process of education in those sciences, that he is forever excluded from the art of medicine, which was to Hippocrates "the art" of all arts.—Sir Andrew MacPhail, The Source of Modern Medicine, *Brit. M. J.* 1932, quoted in Robert Coope, M.D., The Quiet Art, London, E. & S. Livingstone Ltd. (Baltimore, The Williams & Wilkins Co.), 1952, p. 28.

DIAGNOSIS OF HERPES SIMPLEX INFECTIONS BY THE COMPLEMENT FIXATION TEST

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Herpes simplex is among the most ubiquitous of viruses capable of infecting man, and the clinical manifestations of the infection it induces are various. Until recently no simple and rapid serologic test has been available by which the antibody response to infection with this virus could be determined. When serologic studies have been carried out, the virus neutralization test usually has been employed; although antigens for use in complement fixation and skin tests have been described.

The present study was undertaken to explore the value as antigens in the complement fixation test of amniotic and allantoic fluid from infected chick embryos. When such materials were shown to be effective in this respect, the reliability of the test as a diagnostic procedure and as a tool for the epidemiological study of herpes infections was investigated. Earlier workers who applied complement fixation tests to the assay of herpes antibody used antigens prepared from herpetic crusts and herpetic vesicle fluid,[1] infected rabbit brains,[2] or infected foot pads of guinea pigs.[3] À priori it would seem that antigens derived from these sources would be more difficult to prepare and to standardize than egg antigens.

In 1949 Hayward[4] described a complement fixation test for herpes, using as antigen extraembryonic fluids and suspensions of chorioallantoic membranes from herpes-infected chick embryos. She showed that the complement-fixing antigen remains in solution after removal of the infective particles by sedimentation in the ultracentrifuge. She could discern no antigenic differences among several strains of herpes virus which she examined. In 1950 Dudgeon[5] reported successful complement fixation with herpes antiserums using similar egg antigens, and he studied cases of primary and recurrent herpes simplex infection using a suspension of herpes infected chorioallantoic membranes as antigen. Fowler[5a] also has described the use of infected allantoic fluid as antigen in complement fixation tests. Coriell and his associates[6] have recently informed us that they have successfully employed as antigen a suspension of the amniotic sac from embryos infected with herpes simplex virus.

Since this study was made, Afzelius-Alm[6a] has reported his use of the complement fixation test employing both herpes-infected mouse brain and chick chorioallantoic membrane antigens in a study of aseptic encephalomeningitides. He considered the neutralization test on chick embryo chorioallantoic membranes with the use of a strain of herpes simplex that gives good pock-lesions to be superior to the complement fixation test with either antigen. In view of our results and those of others, it seems possible that he unfortunately used a strain of herpes virus that gave a poor complement-fixing antigen in eggs.

Our studies during the past two years have confirmed and extended Hayward's observations. Using infected amniotic fluid as antigen we have investigated the development of complement-fixing antibody in the serums of animals immunized with herpes simplex virus and in patients with proved herpetic infections. The results of complement fixation tests on the serums of human subjects have been correlated with the clinical histories and the types of infection observed.

METHODS

Antigens for the complement fixation test were prepared by two different methods with the use of two strains of herpes simplex virus, i. e., the LF strain and the Z strain. Most of the tests on human serums were done with the Z strain antigen. In neutralization tests the LF strain or the RE strain of herpes was employed.

Origin of the Strains.—LF Strain: The LF strain was isolated from a case of herpes genitalis in 1924 by LeFevre and McKinley. This strain has been studied by several investigators.[7] It has previously undergone many passages in the brains of rabbits, and more recently it has been propagated serially on the chorioallantoic membrane of the chick embryo.

Z Strain: The Z strain of herpes simplex was isolated by us in December, 1949, from a patient with acute primary herpetic gingivostomatitis. Isolation was accomplished on the scarified cornea of a normal rabbit. Keratitis failed to develop in a herpes-immune rabbit simultaneously inoculated with the same material. In the normal rabbit typical herpetic keratitis with conjunctivitis appeared on the third day after inoculation. Three and one-half weeks later, when the animal was killed, corneal scarring was present.

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[1] Todorovitch, K.: La réaction de fixation au cours des inoculations herpétiques chez l'homme et chez le singe, Compt. rend. Soc. biol. **92**: 1017-1018, 1925.

[2] Stroian, N.: Réaction de fixation du complément chez les lapins immunisés contre le virus herpétique, Compt. rend. Soc. biol. **100**: 610-612, 1929.

[3] Bedson, S. P., and Bland, J. O. W.: Complement-Fixation with Filterable Viruses and Their Antisera, Brit. J. Exper. Path. **10**: 393-404, 1929. Brain, R. T.: Demonstration of Herpetic Antibody in Human Sera by Complement-Fixation, and Correlation Between its Presence and Infection with Herpes Virus, ibid. **13**:166-171, 1932.

[4] Hayward, M. E.: Serological Studies with Herpes Simplex Virus, Brit. J. Exper. Path. **30**: 520-529, 1949; Serological Diagnosis of Herpes Simplex Infections, Lancet **1**: 856-858, 1950.

[5] Dudgeon, J. A.: A Complement Fixation Test for Herpes Simplex Infections, J. Clin. Path. **3**: 239-247, 1950.

[5a] Fowler, M.: The Demonstration of Complement-Fixing Antibodies to Herpes Febrilis Virus, Australian J. Exper. Biol. & M. Sc. **28**: 339-342, 1950.

[6] Coriell, L. L.; Schipper, M., and Scott, T. F. M.: To be published.

[6a] Afzelius-Alm, L.: Aseptic (Nonbacterial) Encephalomeningitides in Gothenburg 1932-1950; Clinical and Experimental Investigation with Special Reference to the Viruses of Herpes, Influenza, Mumps and Lymphocytic Choriomeningitis, Acta med. scandinav., supp. 263, p. 1, 1951.

[7] Shaffer, M. F., and Enders, J. F.: Quantitative Studies on the Infectivity of the Virus of Herpes Simplex for Chorio-Allantoic Membrane of the Chick Embryo, Together with Observations on the Inactivation of the Virus by its Specific Antiserum, J. Immunol. **37**: 383-411, 1939. Florman, A. L., and Trader, F. W.: A Comparative Study of Pathogenicity and Antigenicity of 4 Strains of Herpes Simplex, ibid. **55**:263-275, 1947.

Evidence that the agent was herpes simplex virus was afforded by the production of typical lesions of herpes on the chorioallantoic membrane of the chick embryo. Furthermore, complement-fixing antibody that reacted with the known LF strain of herpes virus was shown to develop during convalescence in the serum of the rabbit used for isolation. Results of complement fixation tests on specimens of acute and convalescent serums from the patient yielding this virus indicated that antibody reacting with the homologous and heterologous LF antigens emerged during convalescence.

TABLE 1.—*Results of Herpes Complement Fixation Test on Animal Serums*

	Serum Titers			
	Before Infection		After Infection	
Rabbit No.	LF Antigen	Z Antigen	LF Antigen	Z Antigen
1	No specimen		32	64
2	No specimen		64	64
3	0	0	16	32
4 (Z strain isol.)	0	0	16	64
5	0	0	No specimen	
6 (Vaccinia isol.)	..	0	..	0
7 (Vaccinia isol.)	..	0	..	0
Guinea Pig No.				
1	0	..	128	..
2	0	..	128	32
3	0	..	128	32
4	0	0	32	16
5	0	0	8	8
6	0	0	64	32

Material from the infected rabbit's eye was inoculated with penicillin and streptomycin into the amniotic sac of 8-day chick embryos in which the virus was subsequently carried through 10 serial passages, with the use of undiluted amniotic fluid as inoculum. Most of the embryos of the first two passages survived 72 hours or longer after inoculation. In the subsequent passages most of the embryos appeared either very sick or died within 48 hours. The LD_{50} titer in mice and amniotic fluids from the 10th egg passage was, in most instances, determined as 10^{-4} or 10^{-5}.

Preparation of Herpes Antigens.—LF Strain: Amniotic fluid for use as antigen was obtained by inoculation via the yolk sac of 9-day chick embryos. Inoculums consisted of infected amniotic fluid from previous passages. Preliminary studies showed that the yield of virus was greater in the amniotic fluid after yolk sac inoculation than after intra-amniotic inoculation. Amniotic fluids were harvested from surviving embryos when approximately 25% of those inoculated had already died. This situation was usually encountered on the fourth day after inoculation. This procedure was adopted because fluids derived from dead embryos infected with this strain often proved unsatisfactory as antigens in the complement fixation test. The infectivity titers on the chorioallantoic membrane of amniotic fluids following storage at -20 C averaged approximately 2.4×10^{-7}. The titer of complement-fixing antigen in such pools has been determined as 1:1 or 1:2 in the presence of guinea pig or human antiherpes serums. Serum dilution titers using such antigen undiluted or diluted 1:2 have usually ranged between 1:8 and 1:256.

Z Strain: The pooled amniotic fluids from the 9th or 10th amniotic passages, harvested two days after inoculation of 8-day embryos, used as antigen in the complement fixation test. Lots af antigen prepared at different times when diluted 1:8 or 1:16 have fixed complement with rabbit and human antiherpes serums.

Allantoic fluid and yolk sac material from embryos inoculated into the amniotic sac have also been found to afford antigens comparable to the amniotic fluid in activity. Moreover, fluids from embryos dead for several hours have proved as satisfactory as fluids from living embryos. However, only infected amniotic fluid diluted 1:4 has been used as antigen in this study.

Infected allantoic and amniotic fluids have been stored at -20 C for nine months with little decrease in antigen titer. Heating at 57 C for 30 minutes has reduced the titer by a factor of 2 to 4.

Procedure of Complement Fixation Test.—Complement fixation tests have been performed according to the technique outlined by Enders and Levens for mumps.[8] The end point was taken as the highest initial serum dilution giving fixation of 3+ or 4+. The standard controls have been included in each titration.

Preparation of Immune Rabbit Serum.—Two or more weeks after corneal inoculation with herpes simplex virus, rabbits were bled and the serum removed from the clotted blood. The serum was stored at approximately -15 C.

Preparation of Hyperimmune Guinea Pig Serums.—Immune serums were prepared by intraperitoneal inoculation of guinea pigs with a 10% suspension in saline of the brains of mice dying after intracerebral inoculation with herpes LF. Injections were given at intervals of four or five days and serums collected at these occasions. The high titer serums used in the present study were obtained after three to eight injections.

Neutralization Tests.—The virus-neutralizing capacity of many of the serums which have been tested for complement-fixing antibodies was determined. Prior to use in the neutralization test the LF strain had been readapted to mice by seven intracerebral passages. The LD_{50} titer of pooled eighth passage mouse brain was $10^{-4.6}$ as calculated by the method of Reed and Muench.[9] Decimal dilutions of this virus suspension were prepared in physiological saline solution containing 10% rabbit serum mixed with equal quantities of test serums in 1:2 dilution (including known negative serum as a control), and incubated for two hours at 37 C. Each mixture was then inoculated intracerebrally into mice. After an observation period of 21 days, LD_{50} titers were calculated and neutralization indexes were computed according to the method described by Paul.[10] Neutralization titers rather than indexes were determined for the hyperimmune guinea pig serums mentioned in table 2 by using serial dilutions of the serums and constant amounts of 10^{-1} dilution of herpes LF-infected mouse brain.[11]

EXPERIMENTS

Immunized Animals.—Complement fixation tests with LF and Z antigens on normal and antiherpetic rabbit and guinea pig serums demonstrated that antibody regularly develops after inoculation of the virus. From the data presented in table 1 it will be seen that herpes immunt rabbit and guinea pig serums exhibit complement-fixing titers ranging from 1:8 to 1:128. The lowest (1:8) titer was recorded for the serum of guinea pig 5, which had received only three injections of the virus.

TABLE 2.—*Comparison of Neutralization Titers and Complement-Fixing Titers on Guinea Pig Serums*

	Serum Titers			
	Before Immunization		After Immunization	
Guinea Pig No.	Complement Fixing	Neutralization	Complement Fixing	Neutralization
1	0	8	128	2,048
2	0	0	128	1,510
3	0	0	128	1,478
4	0	4	32	1,024

The virus-neutralizing titers of several herpes immune guinea pig serums against the LF antigen are compared in table 2 with the complement-fixing titers of the same serums. It is evident that, when present in significant concentration, both antibodies were constantly associated, although the ratio of their respective titers was not always the same.

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[8] Enders, J. F., and Levens, J. H.: Mumps in, Diagnostic Procedures for Virus and Rickettsial Diseases, New York, American Public Health Association, 1948, pp. 139-164.

[9] Reed, L. J., and Muench, H.: A Simple Method of Estimating 50 Per Cent Endpoints, Am. J. Hyg. **27**: 493-497, 1938.

[10] Paul, J. R.: The Filterable Viruses, in Laboratory Methods of the United States Army, edited by J. S. Simmons and C. J. Gentzkow, ed. 5, Philadelphia, Lea & Febiger, 1944.

[11] Dr. Isaac Ruchman, Children's Hospital Research Foundation, Cincinnati, provided the serum from patients 4, 13, and 14 and the neutralization indexes on these serums, which he determined with the use of the RE strain of virus.

TABLE 3.—*Results of Complement Fixation Test in Patients with Suspected Primary Herpes Simplex Infections*

Case No.	Age, Yr.	Period After Onset	Complement Fixation Titer
Acute Gingivostomatitis			
1	3	2 days 14 days 14 mo.	0 64 16
2	5	4 days 21 days	0 64
3	4	1st wk. 2nd wk.	16 128
4 *	2	7 days 17 days	8 64
5	Adult	2 days 12 days 14 days	0 16 64
6	4	5 days 1 mo. 4 mo.	0 32 32
7	3	3 days 6 days 15 mo.	0 8 16
8	2	4 days 11 days 12 mo.	8 32 32
9	4	5 days 8 mo.	0 32
10 *	4	1st wk. 18 days	.. † 256
11	1	16 mo.	16
Eczema Herpeticum			
12	23 mo.	7 days 4 mo.	0 32
13 *	9 mo.	8 days 41 days	0 256
14 *	2	5 days 1 mo.	16 128
Eczema Vaccinatum			
15	16 mo.	1 day 8 days 18 days 3 mo.	32 32 32 16
16	30 mo.	6 days 13 days 1 mo.	32 32 32

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* Serums from Dr. Isaac Ruchman, The Children's Hospital Research Foundation, Cincinnati.

† Specimen lost.

Primary Herpetic Infections in Man.—Complement-fixing antibody titers obtained with the serums from 16 cases of suspected primary herpes simplex infection in human subjects are given in table 3. The diagnosis in 11 of these 16 cases was based on clinical criteria as primary herpetic gingivostomatitis, and in five as generalized cutaneous infection which complicated atopic eczema in infancy or early childhood. Herpes simplex virus was isolated from nine of these patients (cases 1 through 4 and 10 through 14). For comparison, two cases of eczema vaccinatum from which vaccinia virus was isolated are included with the three proved cases of eczema herpeticum.

In five cases (4, 5, 10, 13, and 14) virus neutralization tests on early and late specimens of serum revealed rises in antibody sufficient to warrant the serologic diagnosis of infection with herpes simplex virus.

It is apparent that antibody may be present as early as the fourth day of disease and that by the 11th day titers of 1:16 or higher were obtained in all of these patients. In those cases in which the development of antibody *de novo* was not demonstrated, a fourfold or greater increase in titer was recorded. Serums from five additional cases of acute stomatitis not mentioned in table 3 were likewise tested for complement-fixing antibody. In the first specimen, drawn on the 11th day from each patient, a high level of antibody was found which was not exceeded in later specimens.

Herpetic complement-fixing antibody was present in specimens of the serums from two patients with eczema vaccinatum taken on the first and sixth days of the illness. No increase in antibody was demonstrated in specimens obtained during convalescence. It is probable, therefore, that in one, or possibly both, of these patients primary infection with the herpes simplex virus preceded infection with the virus of vaccinia.

Herpes simplex virus was isolated from cases 1, 3, and 11 in rabbits 4, 3, and 2, respectively, and the vaccinia virus from cases 15 and 16 in rabbits 6 and 7 (table 1). Inoculation of these viruses onto the chorioallantoic membrane resulted in lesions characteristic of herpes simplex and vaccinia. Herpes complement-fixing antibody appeared in high concentration in the serums of the three rabbits infected with herpes virus and failed to develop in the two rabbits infected with vaccinia. Thus, the complement fixation test applied to the serums of rabbits used for isolation of the virus has provided confirmatory diagnostic evidence.

This procedure also proved of value in identifying the etiologic agent in two additional cases of infected eczema not included in table 2, since no complement-fixing antibody titers for the patients' serums were available. The serum from one patient contained much antibody which reacted with uninfected amniotic fluid and obscured the complement fixation results. Failure of the rabbit in which the virus from this child was isolated to show herpes antibody suggested that the agent was vaccinia, and this was confirmed by its cultivation on the chorioallantoic membrane. The rabbit inoculated with material from lesions of the second case subsequently presented a high titer of herpes complement-fixing antibody, and the virus in this case was shown to be herpes simplex.

TABLE 4.—*Results of Herpes Complement Fixation Test in Diseases Other Than Herpes Simplex*

Diagnosis	Total Cases	Herpetic Antibody		Cases Showing Increase in Herpetic Antibody
		Present	Absent	
Mumps	2	0	2	0
Infectious mononucleosis	2	1	1	0
Measles	3	1	2	0
Rubella	1	0	1	0
Poliomyelitis	6	2	4	0
Herpangina (Coxsackie)	4	1	3	0
Eczema vaccinatum (vaccinia)	3	2	1	0
Lupus erythematosus disseminatus	1	0	1	0
Erythema multiforme exudativum	3	1	2	0
Total	25	8	17	0

In two patients the level of complement-fixing antibody remained elevated for 12 and 15 months after acute gingivostomatitis, although no history of intervening attacks of herpes labialis or other form of herpetic infection could be elicited.

Nonherpetic Diseases.—In table 4 are summarized the results of herpes complement fixation tests on 25 pairs of acute and convalescent serums from patients with diseases not caused by the virus of herpes simplex. Complement fixation tests on the serums of two cases of mumps and four of herpangina revealed an increase in titer with the homologous virus. The etiologic agent was isolated in each instance in the cases of herpangina[12] and vaccinia and one case of poliomyelitis.

No herpetic antibody was present in either the acute or convalescent serum of 17 of the patients. In eight, significant amounts of herpes antibody were found, but no increase in this factor was demonstrated during convalescence.

Two patients with erythema multiforme exudativum (Stevens-Johnson syndrome) exhibited no rise in antibody. In one of these, indeed, no antibody reacting with herpes virus antigen was discerned in any of the serum specimens. These negative findings are of interest in view of the report by Morgan and Finland[13] of the isolation of herpes simplex virus from the lung tissue of a patient with this disease.

Recurrent Herpes Labialis.—Table 5 summarizes the results of complement fixation tests on the serums from 31 patients with reliable histories of recurrent herpes labialis. For comparison, the results of tests on the serums of 20 patients who gave no history of herpetic infection in any form after exhaustive questioning are likewise included. In both series, many of the patients were children.

TABLE 5.—*Results of Complement Fixation Tests on Serums of Patients According to History of Recurrent Herpes Labialis*

History	No. with Significant C. F. Titer	No. with No C. F. Titer	Total
Positive	30	1	31
Negative	3	17	20

The serums of all but one of the 31 patients with reliable histories of recurrent herpes labialis contained herpes complement-fixing antibody in titers ranging between 1:8 and 1:64, and all but one of these 30 positive serums fixed complement in a dilution of 1:16 or higher. Eight patients showed titers of 1:64. The serum from the only child with clinical recurrent herpes labialis that failed to fix complement likewise contained no detectable neutralizing antibody.

Of the 20 patients giving no history of any form of herpetic infection, three had demonstrable herpes antibody, in titers ranging from 1:4 to 1:16. Only patients who gave histories that appeared to be reliable or, in the case of children, those whose parents appeared to be good observers, were included in this group. Accordingly, the infrequent occurrence of antibody in these patients would suggest that antibodies to herpes simplex develop in few persons without the manifestation of some form of herpetic-like lesions.

In our experience careful and exhaustive questioning with respect to stomatitis and recurrent nasal, facial, genital, or labial lesions compatible with those induced by herpes simplex virus usually results in the recollection by patients or parents of one or another of these conditions. Such persons on first, cursory questioning frequently do not recall having an earlier stomatitis or recurrent lesion. This may account, in part at least, for the frequent lack of correlation between the presence of virus-neutralizing antibody and a positive history of herpetic infection which others have reported. Our own experience, however, suggests that in certain cases inapparent infection may occur as indicated by the presence of complement-fixing antibody in the serums of three persons whose negative statements appeared to be trustworthy.[14]

Comparison of Complement-Fixing Antibody Titers Using LF and Z Antigens.—Thirty-two human serums have been tested for capacity to fix complement in the presence of both LF and Z antigen. Seven rabbit and eight guinea pig serums have been titrated with the two antigens and the results recorded in table 1. All serums that failed to fix complement with one antigen have failed to do so with the other. In most instances the titers of human and animal serums have been identical or differed from each other by a factor of 2. In a few cases they have diverged by a factor of 4. Titers of the serums of animals immunized against either the LF or Z virus appeared to be slightly higher in the presence of the homologous antigen.

Comparison of Complement-Fixing Antibody with Neutralizing Antibody Titers.—In addition to the tests for neutralizing antibody on the serums of guinea pigs 1 through 4 mentioned in table 2, neutralizing indexes have been determined for 28 human serums on which titrations for complement-fixing antibody were also carried out. The results show that, wherever high neutralizing indexes were encountered, complement fixation titers were also elevated. Where very low neutralizing indexes were recorded, herpes complement-fixing antibody was not detectable. No precise quantitative relationship, however, was found between the neutralizing index level and the complement-fixing antibody titer.

We observed one patient with eczema herpeticum in whose serum taken in the acute phase herpes complement-fixing antibody was not present, although it contained a significant concentration of neutralizing antibody. In a specimen taken during convalescence, however, an increase in neutralizing antibody was demonstrated along with the presence of a large amount of complement-fixing antibody.

COMMENT

Our experiments show that there is a close correlation between the results of the complement fixation test for herpes antibody and those of the neutralization test. This fact is of significance in the evaluation of the complement fixation test as a useful diagnostic procedure in suspected herpes infection. In every case of primary herpetic infection in man or the rabbit that we have studied, herpes complement-fixing antibody was present in the convalescent serum specimens. Moreover, an increase of fourfold or more in the concentration of this antibody has been demonstrated during the course of the disease in every case in which the earlier serum specimen was obtained during the first week after the onset. In other acute diseases, including generalized vaccinia (eczema vaccinatum) and erythema multiforme exudativum (Stevens-Johnson syndrome) an increase in herpes antibody did not occur. These findings suggest that the complement fixation test performed in the manner we have described is comparable in accuracy as a diagnostic method with the virus neutralization test. Furthermore, the complement fixation test is more rapid and simpler to perform than the test for neutralizing antibody, which in the past has been employed in most of the serologic studies of herpes simplex infections. From the standpoint of the physician it would be desirable to have available a convenient method whereby the possible role of the herpes virus could be determined in the following conditions: acute or recurrent stomatitis, other acute or recurrent vesicular eruptions of the skin or mucosa, keratitis, and lymphocytic meningitis. The complement fixation test would appear to provide a method of this sort. Thus, in cases in which the development or significant increase of herpes antibody can be demonstrated, this finding is compatible with a diagnosis of primary herpes simplex infection. In accordance with widely accepted practice, we may regard an increase of fourfold in antibody concentration as significant. When the illness in question is recurrent or has already been in progress for over one week, the result of a single test for complement-fixing antibody may be of aid in excluding the possibility of herpes simplex infection when no antibody is found in the serum. If, however, significant amounts of antibody are present under such conditions, no conclusion can be drawn other than that the patient has previously been infected with the virus (except in the case of a young infant, where placental transmission of antibody from the mother is possible).[14]

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[12] The viruses were isolated by Drs. Robert J. Huebner and Edward A. Beeman, Laboratory of Infectious Diseases, Microbiological Institute, National Institutes of Health, Bethesda, Md., who supplied us with the serums from these cases.

[13] Morgan, H. R., and Finland, M.: Isolation of Herpes Virus from a Case of Atypical Pneumonia and Erythema Multiforme Exudativum: with Studies of 4 Additional Cases, Am. J. M. Sc. **217**:92-95, 1949.

[14] (*a*) Scott, T. F. M.: Diseases Caused by the Virus of Herpes Simplex, in Viral and Rickettsial Infections of Man, edited by T. M. Rivers, Philadelphia, J. B. Lippincott Company, 1948. (*b*) Anderson, S. G., and Hamilton, J.: The Epidemiology of Primary Herpes Simplex Infection, M. J. Australia **1**:308-311, 1949.

Recently several groups of workers have questioned whether the virus of herpes simplex is responsible for many cases of recurrent gingivostomatitis [15] and of solitary intraoral ulcers (recurrent aphthous ulcers).[16] Of six patients that we have examined with recurrent stomatitis and without any history of herpes labialis or other recognizable form of recurrent herpetic infection, four were found to have complement-fixing antibody in their serum. In these four cases the possibility remains that herpes virus was the etiologic agent. In two cases, however, no complement-fixing antibody could be detected. It is unlikely, therefore, that this virus was responsible for the disease.

Similarly, in serums from patients with frequent attacks of intraoral ulcers which are often called "aphthous," we have often failed to detect herpes complement-fixing antibody, and thus we must suspect other causes than the herpes virus for these lesions. Since similar oral ulcers are, however, frequently found in association with attacks of herpes labialis and since they also may occur in persons who never had labial herpes but whose serums give positive reactions for herpes complement-fixing antibody, it is possible that some cases of recurrent herpes may be manifested only by such recurrent solitary intraoral (aphthous) ulcers.

From the heterogeneous group of intraoral infections still inadequately classified in respect to the etiologic agent, certain entities are gradually being distinguished. Primary herpetic gingivostomatitis and recurrent herpetic stomatitis have been clearly delineated.[14a] The nonherpetic origin of some cases of acute infectious stomatitis has been established.[17] Viruses belonging to the Coxsackie group have recently been isolated from a condition now defined as herpangina.[18] Further investigation of cases of recurrent stomatitis and of recurrent solitary oral (aphthous) ulcers may reveal hitherto unrecognized agents capable of giving rise to such lesions.

The effect of recurrent attacks of herpes on the level of virus-neutralizing antibody has been studied by previous investigators.[19] In general it has been found that such attacks do not significantly alter the concentration of that antibody. During our study we have collected serums from several patients who have recurrent herpes labialis at varying time intervals after the appearance of the lesions. Not more than a twofold variation has been recorded in antibody titer between serum specimens from any one subject. Thus, with this technique for measuring complement-fixing antibody, no shift of antibody level has been demonstrated either in the direction of a decline coincident with exacerbation of the lesions or in the direction of a rise following their subsidence. Furthermore, there appeared to be no correlation between the complement-fixing antibody titer and the frequency of attacks of herpes labialis.

SUMMARY

1. A complement fixation test for antibody to the virus of herpes simplex is described. The antigen is prepared from infected extraembryonic fluids of chick embryos inoculated intra-amniotically or by way of the yolk sac. Infected amniotic fluid has been used in this study, but allantoic fluid has also been shown to provide a satisfactory antigen. Antigens prepared from two different strains of herpes virus have been used: the LF and the Z strains.

2. The appearance or increase of herpes complement-fixing antibody in the serum of man, rabbit, and guinea pig has been shown to occur regularly following primary infection or immunization with the virus of herpes simplex.

3. An increase in complement-fixing antibody titer of fourfold or greater between acute and convalescent specimens can be regarded as compatible with the diagnosis of primary infection with the virus of herpes simplex.

4. Complement-fixing antibody may appear by the fourth day after primary infection, and it may persist in

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[17] Dodd and Ruchman.[15] Blank and others.[16] Steigman, A. J., and Scott, T. F. M.: Evidence That Virus of Herpes Simplex Does Not Cause Vincent's Angina of the Tonsil, Proc. Soc. Exper. Biol. & Med. **64**: 244-245, 1947.

[18] Huebner, R. J., and others: Herpangina: Etiological Studies of a Specific Infectious Disease, J. A. M. A. **145**: 628-633 (March 3) 1951.

[19] Brain, R. T.: Treatment of Virus Diseases of the Skin, Brit. M. J. **2**: 1064-1066, 1937. Hudson, N. P.; Cook, E. A., and Adair, F. L.: Relation of Herpes Antiviral Property of Human Blood to Sex, Pregnancy and Menstruation, J. Infect. Dis. **59**: 60-64, 1936.

included (with certain very technical exceptions).[6] In addition to these items, some gifts made or trusts created during life [7] and some property which the decedent never owned at all but over which he holds a power of appointment by will [8] may be included. If the physician's property and estate as thus defined may exceed the $60,000 specific exemption, he most certainly needs the help of his professional advisers. This is the most technical subject in the whole field of estate planning. Nothing less than an individual analysis of his particular situation by competent estate planning men will solve his problems satisfactorily.

THE MARITAL DEDUCTION

The "marital deduction," which was mentioned above, is the most important change in the taxation of decedents' estates since the first estate tax law was enacted in 1916. It added an entirely new concept into federal tax theory when it was adopted as part of the Revenue Act of 1948. The primary purpose of the new law was to achieve tax equality between the "community property" states [9] and the "common law" states.[10] Because of local laws relating to property ownership by married persons,[11] the community property states had had an advantage under federal tax laws. The new provision adopts the community property theory "for tax purposes only," without changing laws as to ownership of property.

The marital deduction applies only to the estates of married persons who leave a surviving spouse (it applies equally to the estate of the husband or wife). The law itself, and the Treasury Department regulations interpreting it, are far too complex to discuss here. Its effect on estate taxes and planning can only be summarized. In effect, it provides that when a married person leaves to his surviving spouse a portion or all of his estate, either outright or in such a manner that full control of its final disposition is vested in her, the portion of the estate passing to the spouse is not taxable, but this deduction is limited to one-half the adjusted gross estate. For example, if a married person had died prior to 1948 leaving a net estate of $120,000 to his wife, the estate would have paid a federal estate tax of $9,500. If the full marital deduction is made available by a carefully prepared estate plan, the same estate could be left to a wife in 1952 and the estate would pay no federal tax.

The provisions of the law as to just how property must be left by will or by other methods in order to take advantage of the marital deduction are very technical. In effect, the law requires that the property must be left to the wife in such a manner that the portion excluded from estate taxes at the death of the husband will necessarily be included in the wife's estate and taxed at her death. When the estate of only the husband is considered, the marital deduction is really a "tax deferment" device; but when the estates of both husband and wife are considered together, it is also a "tax-saving" device. The reason for this is that the federal estate tax rates are steeply graduated upward as the size of the estate increases. For example, if a married person should leave a net estate of $200,000 in such a way that no advantage could be taken of the marital deduction, making the entire estate taxable at the death of the husband, the tax would be $32,700. By careful planning and full use of a marital deduction, the taxable estate could be limited to one-half (or $100,000) at the husband's death, resulting in a tax of only $4,800. By proper estate planning, only the other half of the estate (if it is still intact) would be taxed at the wife's subsequent death, limiting this second tax to $4,800. Thus the total taxes on these two successive estates would be only $9,600, effecting a saving of $23,100.

These tax savings can be achieved by careful estate planning without defeating the estate owner's personal desires and plans for his family. This is generally accomplished by creating two trusts in his will and bequeathing about one-half of the property to each trust. The income from both trusts is made payable to the wife for her lifetime. One trust provides that the principal shall be distributed to the children at the death of the wife. The other trust provides that the principal shall be distributed at the death of the wife to the persons she designates in her will, and she usually makes a will designating the children to receive this property also. The marital deduction has given new impetus to the creation of family trusts in wills, and is one more good reason why so many business and professional men are turning to the banks and trust companies for professional and experienced management of their trust estates. The physician should have his plans reviewed periodically by his lawyer and his trust officer to make sure that his plans take advantage of these and other tax savings.

STATE DEATH TAXES

The second group of death taxes to consider are those levied by the various states. Because of much lower tax rates, these are generally far less burdensome than the federal tax but, because of smaller exemptions granted, they apply to far more estates than the federal tax. Eleven states levy an estate tax [12] patterned after the federal tax and differing mainly in the rates imposed and the exemptions granted. These need not be discussed further here. Thirty-seven states and the District of Columbia levy an entirely different type of death tax, generally called an "inheritance tax." [13] As might be suspected, the methods of determining these taxes vary widely between the states, yet the theory of taxation involved in all of them is the same. There is a general pattern in the exemptions granted to, and the rates of tax imposed on, the various classes of persons.

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[6] An insurance policy applied for, purchased, and all premiums paid by a third person from his own funds, with all rights as owner (such as the right to make loans or surrender the policy for cash) held by this third person, and with no reversionary interest in the insured, would not be included as part of the estate of the insured for tax purposes.

[7] The U. S. Internal Revenue Code, sec. 811, includes for tax purposes all property of which the decedent has at any time made a transfer, by trust or otherwise, "in contemplation of death . . . ," or "intended to take effect in possession or enjoyment at or after his death . . . ." These provisions are far too technical to discuss here.

[8] U. S. Internal Revenue Code, sec. 811. This very complex section was completely revised by Congress in 1951.

[9] The eight states having the community property system are Arizona, California, Idaho, Louisiana, Nevada, New Mexico, Texas, and Washington. Prior to 1948 five other states had adopted community property laws. The Pennsylvania law was declared unconstitutional. Michigan, Nebraska, Oklahoma, and Oregon repealed their laws after the Revenue Act of 1948 was enacted.

[10] The other 40 states and the District of Columbia have the common law system of property ownership.

[11] The community property system, coming down from the French and Spanish legal systems, treats the marriage as a "community." In general, property accumulated during the marriage belongs to the community, that is, to the husband and wife equally. Thus they could split the income between them for income tax purposes, and only one-half of the community property was subject to estate taxes at death.

[12] Alabama, Arizona, Arkansas, Florida, Georgia, Mississippi, New York, North Dakota, Oklahoma, Rhode Island, and Utah.

[13] Rhode Island levies both types of tax. Nevada levies no death tax.

An inheritance tax is a tax on the right to succeed to the property of a deceased person. It is generally assessed on the person who receives property, by will or by the laws of descent, and not on the estate itself. In most cases, it is determined by two factors, (*a*) the degree of relationship between the person who receives the property and the deceased person and (*b*) the amount of property received. These factors determine two other facts, (*a*) the exemption granted and (*b*) the rate of tax that applies. It should be noted that these are "personal exemptions," that is, each person receiving property has a separate exemption to apply to the property he receives. The general pattern is to place those most closely related to the deceased by blood and family ties in a favored class, and to grant to the persons in this class the highest exemptions and impose on them the lowest rates of tax. This favored class universally includes the wife of the deceased, and in most states the husband also. Children of the deceased and their descendants are also generally included, although many states grant a lower exemption to adult children than to minors. Some states also include the parents, brothers, and sisters of the deceased in this favored class as to rates of tax, but grant them lower exemptions. Other classes are created by the tax laws and, as the degree of relationship becomes farther removed, the exemptions become lower and the tax rates become higher.

The Illinois inheritance tax furnishes a fair example of how these taxes work. There are four classes as to exemptions and three classes as to rates of tax. Assume that an Illinois decedent made bequests in his will of $20,000 each to his wife, his sister, his niece, and his closest friend (not a relative). Since the wife's exemption exactly equals her bequest, she would pay no tax. The sister would pay $200, the niece $1,170, and the friend $1,990 in inheritance taxes on their respective bequests.

Another important difference between the federal and state tax laws and practices is the property included in the estate for tax purposes. As a general rule the states do not include in the taxable estate life insurance proceeds payable to named persons as beneficiary. In many states a bank or trust company, as trustee of a "life insurance trust," is considered a named beneficiary for this purpose. A number include jointly held property at only one-half the market value. Some exclude the homestead up to a stated amount, and others grant special deductions and exemptions to certain classes of beneficiaries and for certain types of property. While the inheritance taxes of the several states are not as burdensome as the federal estate tax, they must be considered in estate planning. It is possible in many cases to reduce and minimize these taxes by some very simple estate planning devices, such as the family trust described above in the federal tax discussion.

COORDINATING TAX PLANNING

If one can generalize on tax problems, it is to say that the effect of all the types of taxes must be considered together in estate planning. The federal income, estate and gift taxes, and the state income, inheritance, estate, and gift taxes are parts of one problem. A particular step or action may reduce one tax, only to increase another.

A good example of this is the effect of joint tenancy holdings. In a recent estate in Illinois the physician had purchased a home several years ago for $30,000 and placed it in joint tenancy with his wife. When he died about two years ago, his wife sold the home for $46,000. Because the wife acquired the property as surviving joint tenant, her income tax basis was the original purchase price, resulting in a capital gain of about $16,000 and a capital gains tax of about $4,000 in the year she sold it. Had the husband owned the property in his own name and left it by will to his wife, her income tax basis would have been the market value on the date of his death ($46,000), resulting in no gain and no tax at the time of sale. The joint tenancy holding did reduce the Illinois inheritance tax, since the property was included in this tax return at only one-half the market value, but this saving of only $900 did not compensate for the $4,000 federal income tax. The point of this is not that joint tenancies are inherently bad or always cause sizeable tax increases. The point is that each specific property holding and financial transaction should be analyzed as to the effect of all types of taxes, by persons well versed in this technical and complex field. The physician will be well repaid if he will seek the advice of his lawyer, trust officer, and accountant as to his particular situation.

INVESTMENTS AND PROPERTY HOLDINGS

With the effects of various taxes on estate planning set out, what steps should the physician in the middle years be taking to keep his plans up to date? First, he should analyze his property holdings, including his insurance, with his trust officer and life underwriter to determine whether he is keeping a proper balance in his estate. All investments and property holdings are generally classified as either "fixed value" or "variable value" securities. (For convenience the term securities will be used to describe all property holdings.) Fixed value securities are also called "debt securities," and are those that promise the return of a fixed number of dollars at some specified future date with income received in the form of interest. Examples of this class of investments are savings accounts, bonds, real estate mortgages, promissory notes, personal loans, life insurance policies, and annuities. Variable value securities are also called "equity securities" or just "equities," and are those that really represent the ownership of, or a partial interest in, real or personal property. They do not promise to return a specified amount of money at all and generally have no maturity or termination date. Income is generally received in the form of rent, dividends, or profits. Examples of these are real estate, oil and mineral leases, common stocks (preferred stocks have some elements of each class), investment trust shares, partnership interests, small business enterprises (either corporations or sole ownerships), patents, copyrights, and royalties.

There is no specific formula to be followed in balancing the ownership of these investments. No percentage or relation between the two is right to the exclusion of all others. But it is a cardinal principle of sound investing that an estate should include some of each. As the physician discusses this with his professional advisers, he will soon become familiar with the term "diversification" of investments. This formidable term means nothing more than spreading the risk, or "not putting all your eggs in one basket." So stated, the reasons for its importance become obvious. Not only is it important as between fixed and variable value investments, but it is also important within a general class of securities. In common stocks diversification is achieved by spreading one's holdings through several basic industries. In bonds it is achieved by choosing bonds of various corporations or government bodies and with different maturity dates. At this stage of his business life the physician will have, as a minimum, a bank account or two, some bonds, and some life insurance. These are his fixed value investments. He will own a home, an automobile, office equipment, and perhaps a few common stocks. These are his variable value investments. He should take the time to review these with his advisers to determine whether he has leaned too far in one direction or the other. What will be the effect on him and his family if the inflationary trend of the past few years is continued? How would his estate hold up if a period of deflation should be entered? The answers to these and other questions will determine what future investments he should make as funds become available.[13a]

LIFE INSURANCE

If the physician has followed the usual and most advisable course for professional men, he will have increased his life insurance estate steadily through the early years. The total insurance acquired by this time will have been determined by his standards of living, his earnings available for investment, his other property holdings, and his belief in life insurance. By the middle years, the insurance may represent the largest single item in his estate, reaching upward from $50,000 and frequently exceeding $100,000. The pure protection features of the first small, temporary policies will seem less important as other types of property are acquired. The investment features of permanent insurance policies will look more attractive to him as he begins to think of retirement.

The physician should not cease acquiring life insurance in these middle years. His ability to pay for what he really needs may be better than at any previous time. The types of contracts most advisable for him should be worked out with his life underwriter, based on his particular objectives, family situation, and ability to pay premiums. There are some general principles, however, that apply in most situations. First, any temporary policies still in force should be converted to permanent plans, which are less expensive in the long run. Second, the higher premium policies, such as retirement income or endowment, are frequently advisable. Third, endowment policies should not mature before the age of 65, even though the physician has promised himself an earlier retirement date. There is a serious income tax disadvantage if an endowment matures while earnings are still relatively high.[14] It is better to have later maturing endowments and, if early retirement is desired, the cash value can be settled under one of the options in the policy before maturity.

By this time the physician should be in the habit of making complete, regular reviews of his insurance program with his life underwriter. He will have become acquainted with the term "programing" of life insurance. The underwriter will explain that this merely means following an individual program, designed to achieve the purposes and objectives set by the physician and coordinated with his other property holdings and investments. As part of the programing, he will learn of the "settlement options" available in modern life insurance contracts and the methods of using these options to do for his beneficiaries what they cannot do for themselves. Under these options the insurance proceeds remain under the capable and experienced management of the insurance company, and the beneficiary receives a regular income that is assured by contract for life or for a specified period of years.[15] As the physician has been in the process of acquiring a modest list of securities, he will have begun to realize what a problem it is to manage and supervise investments today. He will appreciate that it is unwise to allow a sizeable amount of life insurance to be paid in cash to a widow untrained in the management of property and investments. Frequently such funds are dissipated in a few years. Use of the settlement options is one way of avoiding this unfortunate result.

Another method of providing competent, experienced management for an insurance estate is through the use of a "life insurance trust." This is frequently advisable when insurance forms the bulk of the estate, and is particularly valuable when minor children might be the beneficiaries of the insurance (in the event of the prior death of the wife, or the husband and wife perishing in a "common disaster"). This is a simple arrangement by which the insured (in this case the physician) enters into a trust agreement with a bank or trust company as trustee, and sets out in the agreement all the terms under which the trust fund will be managed. The agreement can be revoked by the insured at any time during his lifetime. The trustee is named beneficiary in the insurance policies and, on the death of the insured, receives the insurance proceeds to manage under the terms of the trust. These terms can be as varied and flexible as those of a trust under a will described below. A life insurance trust can be far more flexible in operation than the settlement options in the insurance contract, and thus is frequently recommended in cases in which changing family needs may require flexibility.

THE FAMILY TRUST

By the time he has reached the middle years, the physician should also have become well acquainted with his lawyer and trust officer. He should be in the habit of reviewing his will and his entire estate plan with these advisers regularly. He will find the lawyer a valued adviser on legal matters affecting his property holdings and the disposition of his estate in case of death. He will find the trust officer a most helpful counsellor on his investment program and on the management of his estate for his family in case of his death. He will learn of the myriad uses of the modern trust as a device to carry on the estate owner's plans after death. He will be shown what a simple matter it is to lay out a plan or program for the support of his family and the education of his children, and then to make sure that the plan is carried out by creating a trust in his will. Under such a plan the physician can place all or only part of his property in the trust at his death; he can provide for the trust to continue for the life of his wife and then to distribute the property to his children; he can provide for leaving the children's shares in trust for their benefit until they reach certain ages specified by him, or he can provide for partial distributions of principal to them at two or three different ages; he can choose whether the income from the trust property is to be paid to his wife, or shared with the children, or accumulated for the children and paid to them when they reach college age, or he can grant the trustee the power to allocate the income on the basis of changing need; he can give the trustee power to use principal as well as income for education and for emergency needs of the family that may arise at some future date. In short, he will learn that the modern trust is one of the most flexible, useful, and valuable devices that has grown up under our system of law. In practical effect, the physician can make the trustee his alter ego, to manage his property and provide support for his family after his death, and to exercise the same careful judgment for their welfare that he would exercise if he were still here.

[13a] Cooper, R. U.: Investments For Professional People, New York, The Macmillan Company, 1951. This is an interesting and informative book on this subject, written in nontechnical language. For the physician who wishes to pursue the subject of investments and insurance further, it contains an excellent bibliography.

[14] The proceeds of an endowment policy, in excess of the cost in premiums paid, are subject to income tax in the year the endowment matures, even though the funds are retained by the company at interest, on the theory of "constructive receipt." If the cash value of the policy is paid out under one of the settlement options selected before maturity, there is some tax relief, but this procedure often defeats the purpose of plans for retirement.

[15] Under the settlement options in most standard contracts the beneficiary may: (1) leave the insurance proceeds with the company at a guaranteed rate of interest, payable monthly; (2) receive payment of a specified number of monthly installments; (3) receive payment of a specified amount monthly for life, with a guarantee of a minimum number of monthly payments to the beneficiary's estate or to another person, if the beneficiary dies within the specified period; (4) receive the proceeds in monthly installments of a fixed amount until the fund is exhausted, with interest on the balance remaining from time to time at a guaranteed rate; or (5) receive payment of a specified amount monthly, jointly for the life of two persons and to the survivor for life, with a guarantee of a minimum number of monthly installments. The contract provides for, or it is company practice to, permit any of these options to apply to the cash values of the policies before they mature as a death claim.

As he reaches the middle years of his practice, the physician will find that his earnings have increased substantially. While his acquisition of property may have seemed discouragingly slow, on careful analysis he will find that he does possess a substantial "estate." Family responsibilities and expenses will have increased considerably, but he will be better able to meet them. Investment of surplus funds will have become a principal concern, but he will have learned that a sound program can be carried out with competent advisers. The demands of the tax collector, both during life and at death, may seem overwhelming, but sound planning can hold these to a minimum. The gradual approach of the age of retirement will be increasingly in his thinking, but the experience gained and the professional advice available will give him self-confidence to look forward to this change as a pleasant prospect. If the physician has achieved average success in his practice, and has given the proper attention to "the business side" of his life, he can look forward to the next few years of his life and practice with anticipation and confidence.

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SURGICAL INDICATIONS IN "SILENT" AND FULMINANT CHOLECYSTOLITHIASIS

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Recent discussions of surgical indications for so-called silent as well for acute and fulminant lithiasis reveal that the opinions of both physicians and surgeons are still widely divergent. The existence of a silent stone has been denied by many surgeons. W. Mayo called it a myth. Other surgeons, while admitting its existence, usually fail to give an explanation. However, the complete absence of clinical signs and symptoms despite the presence of stones in an organ of known sensitivity is not so mysterious as it may seem. Indeed, there is a pathologic basis providing an entirely satisfactory explanation. The following observations in a clinical experiment may serve to illustrate this statement.

THE SILENT ZONE IN THE GALLBLADDER

In a patient with a cholecystostomy the following experiment was made. A flexible probe was introduced through the opening, and the mucosa was scratched in all parts of the fundus of the gallbladder without the patient's feeling any sensation whatsoever. However, as soon as the probe approached the region of the opening of the cystic duct in the neck of the gallbladder, the patient immediately felt a pressure in the epigastrium and then pain, which radiated into the back when an attempt was made to force the probe into the cystic duct. On withdrawal of the probe all painful sensation subsided immediately. These experiments were repeated with the use of a cystoscope for a more exact introduction of a catheter into the cystic duct. This proved to be difficult, but the pain produced by this maneuver almost constantly radiated into the back and at times also into the right shoulder.

These observations indicate that a stone may be silent as long as it remains in the silent zone, that is, in the fundus of the gallbladder. However, once the stones shift into the neck of the gallbladder toward the opening of the cystic duct, the patient feels a marked pressure in the epigastrium and right upper abdominal quadrant, occasionally radiating to the back. An attack of colic indicates that a stone has moved into or is about to pass through the cystic duct. Many additional clinical and experimental observations confirm the concept that this incident is indeed the pathogenesis of the common gallstone attack. Figure 1 may serve to illustrate the different zones in the gallbladder.

The trigger zone for the typical gallstone attack lies at the opening of the cystic duct. From here, not only local but remote spastic contractions may be released, particularly of the sphincter of Oddi and the duodenum, followed occasionally by retrostalsis and vomiting. In

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From the surgical staff, St. Clare's Hospital.

contradistinction to the sensitivity of the zone at the opening of the cystic duct, it was observed that touching the interior wall of the common duct and passing a tube through the papilla to and fro into the duodenum did not in any single instance release a pain reflex. This was rather surprising, since it is commonly believed that a passage of a stone from the common duct through the papilla is invariably followed by a severe colic attack. These observations could be made invariably in the cases in which common duct stones had been dissolved by the ether method and the obstructed papilla liberated.

One can therefore safely conclude that a common duct stone may also pass through the papilla without causing any pain. Intense pain, however, may be caused by an increase of the intraductal pressure. This can be convincingly demonstrated in patients in whom a rubber tube is sutured water-tight into the common duct. Injection of some ether, which evaporates at body temperature, causes intense colic-like pain, which subsides immediately when the tube is opened and the ether allowed to evaporate. The colicky pain observed in choledocholithiasis and as a postcholecystectomy syndrome is a secondary pressure syndrome caused by the occlusion of the papilla, usually by a spasm of the sphincter of Oddi. Provided obstruction does not occur, stones may lie in the common duct indefinitely. This is particularly true when the duct is enlarged, so that pressure syndromes are less likely to occur. The term "silent common duct stone" is well justified.

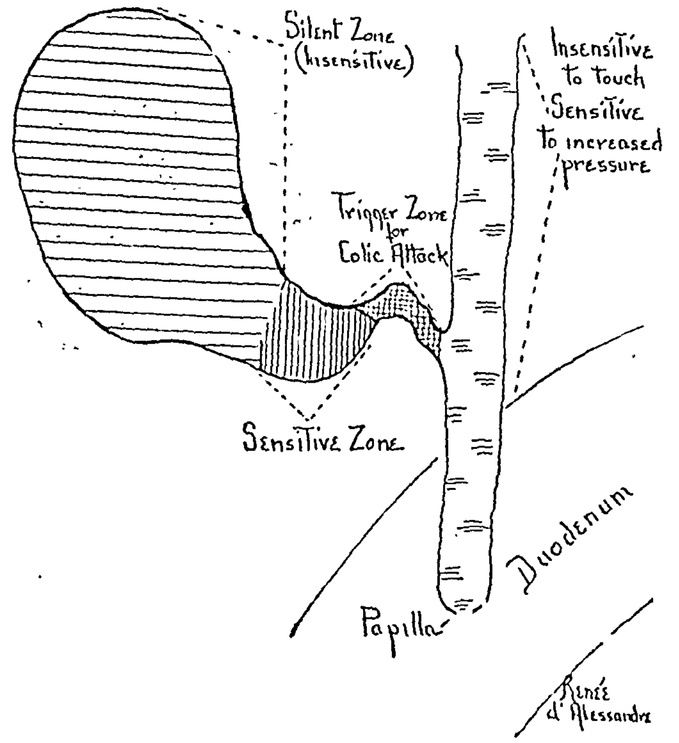
Silent Zone (Insensitive)
Insensitive to touch
Sensitive to increased pressure
Trigger Zone for Colic Attack
Sensitive Zone
Duodenum
Papilla
Renée d'Alessandro

Fig. 1.—Sketch illustrating the different zones in the gallbladder.

Case 1.—A white woman, 49, was operated on during a quiescent period two years after her last gallstone attack. At operation, seven faceted stones were found lying in an enlarged common duct, stones that obviously had emerged from the gallbladder during her previous attack of serious colic, as far back as two years. In the silent zone of the gallbladder there were five faceted stones.

However, such a course is rare, and it is a well-known clinical experience that in most instances such a silent state is of limited duration. Usually, sooner or later, owing to contraction of the gallbladder, the stones move from the silent zone into a more sensitive one, to produce a typical attack of biliary colic. The gallstone attack, produced by the entering of a stone into the trigger zone at the opening of the cystic duct, may subside under one of the following conditions: 1. The stone passes through the cystic into the common duct. 2. The stone becomes impacted in the cystic duct. 3. The stone shifts back into the silent zone of the fundus. Each of these conditions may develop into a different and distinct pathologic entity.

Stones that pass into the common duct may cause all the well-known complications of a choledocholithiasis, such as, obstructive jaundice, cholangitis, liver abscesses, and liver damage, to a functional breakdown in hepatic coma.

When a stone becomes impacted in the cystic duct, an acute gallbladder condition develops, generally known under the term "acute cholecystitis." However, in many instances an actual bacteriologic inflammation may be completely absent or develop only secondarily. The possible serious sequelae of an acute obstruction of the cystic duct are interference with the blood supply of the wall of the gallbladder, hemorrhagic infarction, gangrene, rupture, and general or localized peritonitis. In other instances, an infection flares up in the obstructed gallbladder, leading to empyema, abscesses in the liver bed, and secondary cholangitis.

A stone shifting back into the fundus of the gallbladder may restore the pleasant state of silent cholelithiasis.

One might well say that gallstones are somewhat like dogs, in that the smaller they are, the more noise they make. Small stones often indicate their presence by loud and alarming syndromes, when they force their way through the cystic duct. Large stones, on the other hand, which cannot pass through the cystic duct, may lead to serious complications, in a very different and indeed often silent way. Such complications may develop without any premonitory clinical signs up to the time the patient is admitted to the hospital for emergency surgical care, and the etiology is frequently discovered only at operation. A large gallstone that has been silent for many years may compromise the blood supply of the gallbladder, leading to gangrene, an incident which may become clinically alarming only after rupture. A large stone may also perforate into the duodenum without any marked clinical signs or symptoms up to the time the patient is admitted to the hospital with the signs of an acute intestinal obstruction. Very often the diagnosis "gallstone ileus" is established only at operation. Two such cases with an entirely unrevealing history may be cited:

Case 2.—A man of 60, with no history of any abdominal disease, was suddenly taken ill, with pain in the greatly distended epigastrium and incessant vomiting. The preoperative diagnosis was volvulus of the stomach. Operation revealed that a gallstone the size of a large chestnut that had perforated from the gallbladder had caused an obstruction of the pylorus.

Case 3.—A man of 75 had never had any abdominal or digestive trouble. On Nov. 4, 1950, after a heavy meal, he felt "blown up" and took some castor oil at bedtime. He had only a slight bowel movement on the following day, and abdominal distention was still present; he felt slightly nauseated but did not vomit. His temperature rose to 101 F. The doctor who examined him on November 6 noted tenderness in the right side of the abdomen and suspected intestinal obstruction. The patient was admitted for surgery and was operated on the same evening. A gangrenous gallbladder with a large stone impacted in the neck was found. There were multiple abscesses in the wall of the gallbladder and in the liver bed. Electrosurgical operation was followed by an uneventful recovery.

The indication for surgery in the presence of a silent gallstone resolves itself into the question of whether to operate for the purpose of preventing hardly calculable but frequently life-endangering complications or to delay the operation until clinical signs appear. However, as outlined above, the appearance of the first clinical symptoms frequently may coincide with the development of serious complications.

I am of the opinion that the best procedure is to explain to the patient the basic pathology in all its details, particularly why the gallstones are silent at the moment and nevertheless present a danger that may become alarming at any time. Most patients respond satisfactorily to this approach, as evidenced by their appearance for examination at the first onset of symptoms and their request for operation. Others, without waiting for alarm signals, prefer to choose the time for their operation according to their convenience. Most of them, however, on having their disease explained, realize that there is no alternative to operation and that it is only the time that is left to their discretion, as long as the stones remain in the silent zone of the gallbladder. Experience, however, shows that in most instances this time is limited and that before long the stones will move, an incident that might be due to a forcible contraction of the gallbladder, provoked by an ice-cold drink or occurring in the course of indigestion.

SURGICAL INDICATIONS IN ACUTE GALLBLADDER OBSTRUCTION

Acute gallbladder obstruction is generally called "acute cholecystitis," a term that is misleading. The incident, which is followed by the well-known dramatic clinical picture, is primarily not an acute inflammation of the gallbladder but is invariably an acute obstruction of the cystic duct. Even in cases of stoneless but fulminant ulcerative typhoid cholecystitis, the importance of an acute obstruction of the cystic duct by edema or fibrin was convincingly verified in a series of six cases. Numerous ulcers were present, some penetrating deeply into the submucosa. These were certainly of long duration without alarming clinical syndromes, when a sudden block of the cystic duct, obviously caused by a fibrin clot (found at operation), produced a fulminant attack of colic, followed by a palpable and extremely tender gallbladder. In three cases an almost painless perforation was observed, with fatal issue in all instances. No obstruction of the cystic duct was found at necropsy.

Acute obstruction of the cystic duct may or may not be followed by a flare-up of a latent infection. Moreover, the development of complications, in particular a rupture of the gallbladder, rarely depends on the actual bacteriologic infection. The determining factor is the degree of compromise of the blood supply to the wall of the gallbladder, usually caused by the spastic contraction of the neck of the gallbladder around a large obstructing stone. Gangrene of the gallbladder with perforation and sometimes severe bleeding into the abdominal cavity may develop within 24 to 48 hours after the onset of the first symptoms. Several such cases have been reported.[1] Histologic study of resected gallbladders in the presence of acute obstruction demonstrated compromise of the blood supply in varying degree in many instances. The circulatory disturbance was especially marked in the capillaries of the fundus. The incidence of vascular damage was particularly high in cases in which a large stone was firmly impacted in the neck of the gallbladder, whereas such damage was rarely seen when occlusion was caused by a small stone located in the cystic duct.

The indications for surgery in "acute cholecystitis" have been greatly influenced by the comparison with those in acute appendicitis. It is felt that such a comparison fails to do justice to the special characteristics and fundamental differences between these two conditions. An acute appendicitis is comparable to a pointing abscess with highly infectious content, which may burst into the free abdominal cavity at any time. Fractions of an hour may count. Once the appendix has ruptured, all alarming symptoms may subside dramatically, leaving the patient in the dangerous latent phase between the relief following rupture and the onset of the first symptoms of general peritonitis. The symptoms following an acute obstruction of the gallbladder are rather those of an abdominal shock related to the abrupt occlusion or the twisting of viscus, as seen in the cases of torsion of the gallbladder. Even in the rare cases of hemorrhagic infarction and total gangrene of the gallbladder, the development of the pathologic changes are much slower and a delay of some hours has not the same fateful bearing as in acute appendicitis. Immediate operation in a case of acute obstruction of the gallbladder means actually operating on a patient in abdominal shock. These are definitely emergency cases, but only in the sense that the patient should be admitted to the hospital without delay and be placed under surgical observation. It is felt that the time for operation should not be chosen according to the strict rules as established for acute appendicitis, that is, as soon as the operating room is ready, but should be individualized. After medication with glyceryl

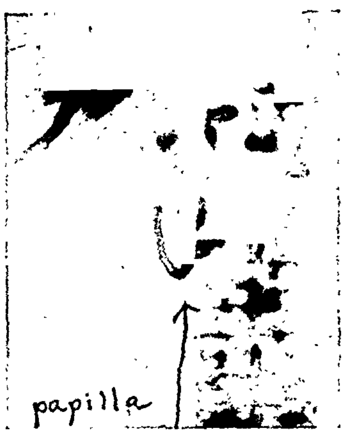

Fig. 2.—Roentgenogram showing the rubber tube passed into the duodenum after liberation of the obstructed papilla by the ether method.

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[1] Leared, H.: Gall-Stone Impacted in the Common Duct of the Liver: Rupture of the Gall-Bladder, and Death from Haemorrhage, Trans. Path. Soc. London **10**: 177, 1858. Schnyer, K.: Todliche Gallenblasenblutung in die freie Bauchhöhle, Zentralbl f. allg. Path. u. path. Anat. **26**: 361, 1915. Gjellerup, O.: Et Tilfaelde as ruptura vesicae felleae med maegtig intraperitoneal haemorrhage, Hospitalstid. **64**: 826, 1921. Waters, E. C.: Perforation of Gallbladder with Intraperitoneal Hemorrhage, M. J. & Record **123**: 11, 1926. Bartlett, W., Jr., and Bartlett, R. W.: Perforation of Gallbladder with Massive Intraperitoneal Hemorrhage, J. A. M. A. **106**: 615 (Feb. 22) 1936. Mailer, R.: Spontaneous Rupture of Gall-Bladder with Massive Intraperitoneal Haemorrhage, Brit. J. Surg. **27**: 91, 1939.

trinitrate, the painful spastic conditions and the primary shock syndromes usually subside quickly, and a more specified diagnosis than that of "acute cholecystitis" can be established. The decision as to whether one should proceed with surgery or defer the operation can be based on a sounder basis. The following rules, dependent on the development, have proved satisfactory.

1. When the pain becomes localized in the right upper abdominal quadrant, where an enlarged gallbladder can be palpated, the diagnosis that the stone has become impacted in the cystic duct is certain. Ice bags are applied locally, supporting measures are started, and the operation may be performed on the third or fourth day after the attack.

2. When, after the acute colic attack has subsided, abdominal tenderness spreads to the right lower quadrant, with a maximum around McBurney's point, the intercostal spaces in the posterior axillary line are tender on pressure, the patient looks ill in spite of relief of pain, and marked traces of bilirubin appear in the urine as early as three to four hours after the attack, the diagnosis of hemorrhagic infarction and perforation is almost certain and operation is performed without delay.

3. When relief from pain after the attack is almost complete, no palpable mass is felt in the right upper abdominal quadrant, general conditions are good, and jaundice supervenes 12 to 24 hours after the attack, the operation is delayed until, under daily control of the serum bilirubin level, the question can be answered as to whether the stone, having slipped into the common duct during the attack, has passed into the duodenum or has become impacted in the papilla. In the latter case the patient is operated on as soon as all preoperative measures have been completed, usually not later than 8 or 10 days after the first attack. If the jaundice shows a tendency to subside, as demonstrable in the falling serum bilirubin curve, operation is postponed until all clinical signs have disappeared and results of laboratory tests have become normal.

WHAT OPERATION SHOULD BE PERFORMED IN ACUTE CONDITIONS?

In reviewing the recent literature on surgery for acute cholecystitis, one notes a certain trend toward the revival of cholecystostomy, with a recommendation for the wider use of this operation particularly in poor risk patients. This is interesting, because the history of gallbladder surgery reveals that some 40 years ago Kehr,[2] one of the most experienced pioneers in surgery of the biliary tract, strongly condemned cholecystostomy as a poor operation. Kehr stressed repeatedly that the development of gallbladder surgery—40 years ago—"could no longer justify such an incomplete and in all respects unsatisfactory operation, which when still carried out by some surgeons demonstrates a very limited experience in this particular field of surgery." Kehr based his opinion on a comprehensive statistical analysis of more than 2,000 patients, on all of whom he had operated. In evaluating this opinion, one must bear in mind that the condition in most of these cases was acute and the patients were poor risks. The more chronic and not alarming cases were not referred to the surgeon because at that time physicians and surgeons alike did not consider gallbladder disease per se an indication for operation. Moreover, nothing of the modern arsenal of supportive therapy, such as expert anesthesia, antibiotics, and blood transfusion, were at the disposal of the surgeon to lessen the surgical risk. Comparing these two periods in surgical history, one must note that, while half a century ago cholecystostomy was condemned altogether by many experienced surgeons for its poor late results, it now seems accepted as satisfactory and as having a definite place in gallbladder surgery. This is difficult to explain, because modern statistics conforming with the old ones definitely do not justify this trend. The statistics published by the Metropolitan Life Insurance Company[3] demonstrate clearly that the expected death rate in gallbladder diseases is highest after cholecystostomy: 95.9% of the expected death rate occurred with cholecystectomy, 115.1% with medical treatment and 155.7% with cholecystostomy, which increased to 214.0% when stones were present. Other statistics from different surgical institutions conforming with my experience likewise show poor results and fail to prove that the results of cholecystostomy are any better than formerly believed. Decourcy[4] reported a mortality rate of 28.6%, and Heyd, Carter, and Hotz,[5] analyzing 3,986 operations for acute cholecystitis, reported a mortality rate of 28.8% after cholecystostomy. According to Cave's[6] statistics, a second operation had to be performed in about 56%.

The reason for the poor results following cholecystostomy may be summarized as follows:

1. The immediate and dramatic relief following opening and drainage of an acutely inflamed gallbladder should not deceive the surgeon. The patient is not safe. In the majority of cases simple drainage of the gallbladder is inadequate to control a serious infection. Frequently abscesses are present around small stones that have penetrated deeply into the liver bed. The progress of the infection is one of the main contributory causes of the later mortality. This has been most impressively demonstrated at necropsies.

2. The presence of stones in the common duct and of cholangitis may be completely obscured by the dramatic syndromes of acute cholecystitis. Cholecystostomy in such cases controls only a part of the biliary tract disease and in many instances not even the most serious one.

3. In many cases the surgeon performs cholecystostomy as a first-stage operation with the intention of doing a cholecystectomy as a second-stage operation when the condition of the patient has improved. However, there is no guarantee that the expected improvement will occur, and frequently the course of the disease

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[2] Kehr, H.: Die Praxis der Gallenwege-Chirurgie, I. u. II. München, Lehmann, 1913.

[3] Dublin, L. I.; Jimenis, A. O., and Marks, H. H.: Factors in Selection of Risks with History of Gall-Bladder Disease, Proc. A. Life Insur. M. Dir. America **21**: 34, 1934.

[4] Decourcy, J. L.: Improved Gall-Bladder Technic, with Especial Reference to Omission of Drainage, Ann. Surg. **98**: 333, 1933.

[5] Heyd, C. G.; Carter, R. F., and Hotz, R.: Surgery of Biliary Tract: Study of Factors in Surgical Morbidity and Mortality, Am. J. Surg. **44**: 679, 1939.

[6] Cave, H. W.: Immediate or Delayed Treatment of Acute Cholecystitis: Liver Shock and Death, Surg., Gynec. & Obst. **66**: 308, 1938.

may necessitate a second operation under conditions worse than those present during the first operation. The following case report may serve as an illustration:

Case 4.—A man, 54, was operated on for an acute condition of the gallbladder in March, 1924. Cholecystostomy was performed with the idea that taking a minimum risk in this patient was of outstanding importance. A solitary occlusion stone was removed from the neck of the gallbladder. After one week of uneventful recovery, chills with spiking temperature set in, necessitating a second operation. Cholecystectomy was then performed. However, the patient died four days after showing the clinical symptoms of multiple liver abscesses. The infectious process was not controlled by the cholecystostomy and progressed in spite of the removal of the obstructing stone and drainage of the gallbladder.

4. A second-stage cholecystectomy is incomparably more difficult and is followed by a higher mortality rate (over 9%).

The conception of poor risk patients as an indication for cholecystostomy frequently does not stand critical analysis. If the poor risk is considered to be due to a state of general debility, it would seem more advisable to postpone the operation and to administer corrective therapy until the conditions have improved and the patient is likely to stand the radical operation. If, however, the poor risk is due to serious local complications, such as gangrene, a ruptured emypema, or signs of cholangitis, a radical operation is mandatory, and this may include exploration of the common duct. Local complications and difficulties found at operation should not induce the surgeon to terminate the operation prematurely without having removed the main source of danger. It must, of course, be realized that an operation on the gallbladder and biliary tract, simple as it may be in many instances, in others may be most difficult and require all the skill of an experienced surgeon. For the cases in which the condition is acute and in which there is severe infection, electrosurgical dissection (mucoclasis) is strongly recommended. It offers the ideal method for dealing with local abscesses in the liver bed and for bringing an infection under safe control. Electrocoagulation transforms the operative field into an almost sterile area without any oozing of bile or blood. With this safe method at our disposal, it is believed that there is no need even in poor risk cases to adopt such an unsafe and inadequate procedure as cholecystostomy for the surgical treatment of cholecystolithiasis. All authors with experience with this method agree as to its value.[7] Case 5,[7a] in which electrosurgical operation was done in 1929, presents an interesting accumulation of risks.

Case 5.—A woman of 75 years, a diabetic who had been suffering for years from chronic heart conditions, with marked edema of her legs and chronic (arteriosclerotic) nephritis, had an acute gallstone attack followed by jaundice and daily chills. Her cardiovascular condition deteriorated rapidly during her attacks of chills, and surgery seemed to offer the only chance in spite of all the odds of extremely poor risk. Operation was performed under general anesthesia. Electrocoagulation of the gangrenous and epyematous gallbladder was done, and an obstructing stone, the size of a chestnut, was removed from the common duct. The patient had a surprisingly uneventful recovery. After removal of the badly infected gallbladder, her heart condition improved rapidly, the diabetes, obviously due only to acute pancreatic damage, disappeared, and the patient left the hospital in a remarkably good state of health. Eleven years later, at 86, she was the only surviving member of her family.

Since 1928 the electrosurgical method has been used as a routine in all cases of acute cholecystitis. During this period cholecystostomy was not performed any more in a single instance. The following statistics may serve to justify my surgical policy and at the same time evaluate other methods, such as the ether method.

In 1928, I published a report of 200 successive cases in which mucoclasis was done with no hospital mortality. This series included 33 cases of acute gallbladder conditions with occlusion of the cystic duct without complications, 14 cases of gangrene plus empyema, 3 cases of acute perforation (early stage), and 2 cases of perforation with biliary peritonitis—a total of 52 cases of acute gallbladder conditions with complications in 19 cases. In the other cases choledocholithiasis was also present.

In a second series (published in 1930), in which mucoclasis was done in 303 cases, there was a hospital mortality of 7 (2.3%). The series included 109 cases of acute and fulminant gallbladder conditions with complications in 23. Gangrene, empyema, and local liver abscesses were present in 16 cases, perforation in 6, and acute pancreatitis in 1. The causes of death were hepatic coma, 1 case; coma and septicemia (liver abscesses), 3 cases; acute pancreatitis, 1 case; pneumonia, 1 case; and overlooked common duct stone, 1 case.

Causes of Death in 40 Fatal Cases in 1,420 Cases

Cause	No. of Cases
Hepatic coma	14
Pancreatitis	6
Septic cholangitis (liver abscesses)	5
Pneumonia	6
Septic enteritis (typhoid group)	2
Parotitis	3
Diffuse purulent peritonitis (present at operation)	3
Embolism	1

Among 1,420 patients operated on from 1925 to December, 1950, there was a mortality of 40 (2.8%). Cholecystolithiasis without common duct disease was present in 860 cases, in which there was a mortality of 8 (0.9%). Cases in which there was an acute fulminant condition numbered 288, with a mortality of 5 (1.7%). The causes of death were pneumonia, in 2 cases; acute pancreatitis, 1 case; septic parotitis, 1 case; and purulent peritonitis (present at operation), 1 case.

Among 560 patients with choledocholithiasis, 32 deaths (5.7%) occurred. Of these, 350 were operated on before the ether method was used, with 26 deaths (7.5%). After the ether method came into use, I operated on 210 patients, but employed this method in only 73, with a mortality of 6 (2.6%).

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[7] (*a*) Pribram, B. O. C.: Preoperative and Postoperative Treatment in Hepatobiliary Disease, S. Clin. North America **28**: 493, 1948; (*b*) Mukoklase und drainagelose Gallenchirurgie, Zentralbl. f. Chir. **55**: 773, 1928; Zur Technik der Gallenchirurgie, ibid. **55**: 2504, 1928; Fortschritte in der chirurgischen Behandlung des Gallensteinleidens (Mukoklase, drainagelose Operation), Med. Klin. **24**: 1147, 1187, 1928; Zur Technik der Mukalose, Zentralbl. f. Chir. **56**: 1054, 1929; Fortschritte in der Erkenntnis der Pathologie und der chirurgischen Behandlung des Gallensteinleidens, Jena, Fischer, 1930; Electrosurgical Obliteration of the Gall-Bladder, Lancet **1**: 760 (March 26) 1938; Urgent Surgery of the Liver and Bile Ducts, in Spivak, J. L.: Urgent Surgery, Springfield, Ill., Charles C Thomas, 1946. (*c*) Thorek, M.: Cholecystelectrocoagulectomy Without Drainage in Treatment of Gall-Bladder Disease, Illinois M. J. **64**: 425, 1933. (*d*) Mirizzi, P., and Olmedo, F. A.: La mucoclasia de Pribram, Rev. de cir. Buenos Aires **10**: 681, 1931; La cholecystectomie sans drainage, Paris, Masson Frères, 1933. (*e*) Albertin, R.: Suppression de la vésicule bilaire par la méthode de Pribram, Lyon chir. **30**: 207, 1933. (*f*) Pop, A.: Die Pribram'sche Mukoklase bei den Erkrankungen der Gallenblase, Zentralbl. f. chir. **58**: 3194, 1931. (*g*) Bailey, H., and Love, R. J. M.: Electrosurgical Obliteration of Gall-Bladder Without Drainage (Thorek's Operation), Brit. M. J. **2**: 682, 1939.

It seems doubtful that any one of these fatalities could have been prevented by performing a cholecystostomy instead of the radical electrosurgical operation. But it is believed that several patients in this series would have died of later complications, or after a necessary second operation, if cholecystostomy had been performed instead of the primary radical operation. All fatalities date back to the preantibiotic era. With these powerful weapons for fighting the spread of infection, and with the advantages offered by the electrosurgical technique of operation, it is felt that radical surgery, i. e., the removal of the acute gallbladder, can be performed as routine even in so-called poor risk cases and that cholecystostomy should be reserved for only exceptional cases or in the absence of a trained surgeon and proper hospital facilities.

SUMMARY

1. The clinical conception of "silent lithiasis" is well founded and is explained by the fact that the mucosa of the fundus of the gallbladder is a silent, insensitive zone. Within this zone stones may lie indefinitely without causing any clinical symptoms. The appearance of pressure syndromes and pain indicates that the stones have shifted to the sensitive zone in the neck of the gallbladder at the opening of the cystic duct. In this area is the trigger zone for the typical gallstone attack and all its spastic syndromes. The common gallstone attack is caused by a stone that has slipped into or passes through the cystic duct. No pain or any sensation is felt when a stone passes through the papilla into the duodenum. The colic attack caused by a stone in the common duct is due to an increased bile-duct pressure following an obstruction in the papilla. Provided no obstruction occurs, a stone in the common duct may also be silent.

2. The indications for surgery in "silent lithiasis" and in attacks of an "acute gallbladder" (acute cholecystitis) are discussed.

3. Cholecystostomy has poor results in a longer follow-up. It can be safely replaced by the electrosurgical dissection (mucoclasis), which gives highly satisfactory results in all badly infected and poor-risk patients.

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INTRASPINAL LESIONS MASQUERADING AS PROTRUDED LUMBAR INTERVERTEBRAL DISKS

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and
John D. Camp, M.D., Rochester, Minn.

For about every 25 operations performed for protruded lumbar intervertebral disk at the Mayo Clinic, one operation is performed for spinal cord tumor that is so situated that, at some time during its course, it could simulate a protruded lumbar intervertebral disk. One of our cases illustrates this statement especially well.

A man, 41, a white collar worker, came to the Mayo Clinic in 1940 complaining of low back pain, with extension along the left sciatic nerve. His symptoms had been present intermittently for the previous three years. Examination revealed slight limitation of forward bending, Lasègue's sign of sciatica on the left, diminution of the quadriceps reflex in the left leg, and slight weakness of the left leg. Simple roentgenographic examination of the thoracic and lumbosacral portion of the spinal column showed nothing abnormal. A provisional diagnosis of protruded intervertebral lumbar disk was made and intraspinal investigation was recommended. The patient declined further study and returned home. He returned eight years later, in 1948, at which time the presence of spinal cord tumor was evident from the symptoms and neurological findings. Intraspinal investigation and subsequent operation disclosed the presence of a neurofibroma at the level of the 12th thoracic vertebra.

The spinal cord tumors with which we are concerned in this discussion are those that occur at the level of, or caudad to, the tenth thoracic vertebra. Owing to the disparity in length between the spinal cord and the vertebral axis, the lumbar segments of the cord lie at the level of the 10th, 11th, and 12th thoracic vertebrae, and the nerve roots originating from these lumbar segments of the cord pass obliquely downward to exit through their respective intervertebral foramina.

From a clinicosurgical standpoint, intraspinal tumors can be conveniently classified into three categories as follows: (1) intramedullary (that is, in the substance of the cord), gliomas, hemangiomas, and others; (2) intradural and extramedullary neurofibromas and meningiomas; and (3) extradural neurofibromas, sarcomas, myelomas, lipomas, and metastatic carcinomas (fig. 1).

Intramedullary tumors, because they rarely produce radicular pain and, moreover, because they present their own fairly characteristic picture, should not be difficult to differentiate from protruded intervertebral disks; also, they occur relatively infrequently. It is of interest to note, however, that in one of the two instances of intramedullary tumor encountered in this review, the signs and symptoms were such that a tentative diagnosis of protruded lumbar intervertebral disk was made.

The tumors of the second and third categories are so situated in relation to the nerve roots that they can, in their early stages, before the symptoms of cord compression become evident, simulate those of protruded lumbar disk.

DIFFERENTIAL DIAGNOSIS

The true nature of the lesion producing the patient's complaints can generally be determined by careful consideration of certain factors in the history and examination.

Night Pain.—A patient harboring a spinal cord tumor will often experience radicular pain four or five hours

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From the Section of Neurologic Surgery (Drs. Craig and Svien) and the Section of Roentgenology (Dr. Camp), Mayo Clinic. Dr. Dodge is Assistant to the Staff.

after recumbency. This pain is severe enough to awaken him from sleep. In order to obtain relief, he finds it necessary to walk the floor, and frequently he finishes his night's sleep sitting in a chair. The mechanism of this pain is thought to depend on the lengthening of the vertebral axis in recumbency with consequent pulling on the involved nerve roots, due to the ballooning of intervertebral disks, which in the recumbent position are freed of weight bearing.

Intractable Pain not Relieved by Conservative Management.—Continuous pain that is not relieved by conservative treatment, so unlike the pain that is typical of the usual protruded disk, should arouse suspicion that a tumor is present.

Persistent Pain After Operation for Protruding Disk.—It is not unusual at this clinic to remove a spinal cord tumor from a patient who has had a previous operation for protruding disk without relief of symptoms. In our series there were three such cases.

Intraspinal Tumors and Instances of Arachnoiditis Among 1,296 Intraspinal Lesions Originating at or Below the Tenth Thoracic Vertebra

	Cases
Neurofibroma	13
Ependymoma of filum terminale	13
Metastatic carcinoma	4
Vascular anomaly of cord	3
Meningioma	2
Dural cyst	2
Intramedullary ependymoma	1
Intramedullary glioma (unverified)	1
Osteogenic sarcoma	1
Osteoma	1
Giant cell tumor	1
Chronic granuloma, intradural	1
Granuloma of intervertebral disk (brucellosis?)	1
Extradural hematoma	1
Extradural angioma	1
Lymphosarcoma, Hodgkin's type	1
Intradural, extramedullary hemangioma	1
Brain tumor implant	1
Extradural angiosarcoma	1
Chordoma	1
Arachnoiditis	3

History of Disturbance in Urinary or Bowel Habit.—A history of urgency, frequency, or incontinence of urination should not be dismissed perfunctorily as due to prostatism in the male or to cystocele following delivery and similar conditions in the female. Inasmuch as these symptoms occur fairly early in spinal cord tumors involving the lumbar segments, the conus medullaris, and cauda equina, and are extremely uncommon accompaniments of protruded disks in this region, they should be investigated thoroughly.

Hyperactive Reflexes.—Hyperactive reflexes are a sign of pressure on the pyramidal tract and are not found in protrusion of the lumbar disk. However, a tumor of the spinal cord involving the lumbar segments of the cord will produce this finding when the stage of compression of the cord has been reached. Reflexes should be checked carefully, and not only in the lower extremities; the activity of the reflexes in the lower extremities should be checked against those in the upper extremities.

Spasticity.—The presence of spasticity points to involvement of the spinal cord. The mechanism of its production is the same as that producing hyperactive reflexes, namely, compression of the spinal cord. Generally hyperreflexia and spasticity are found concomitantly, but occasionally hyperreflexia is associated with flaccidity. The flaccidity results from extensive involvement of the cells of the anterior horn and nerve roots in these cases.

Muscular Atrophy.—Muscular atrophy occurs in only 2% of cases of lumbar protruded disks but is common in cases of spinal cord tumors involving lumbar segments. With this finding the possibility that a tumor is present should always be considered. Muscular atrophy can result from extensive involvement of the nerve roots, but the most usual cause is compression involving the cells of the anterior horn of the spinal cord.

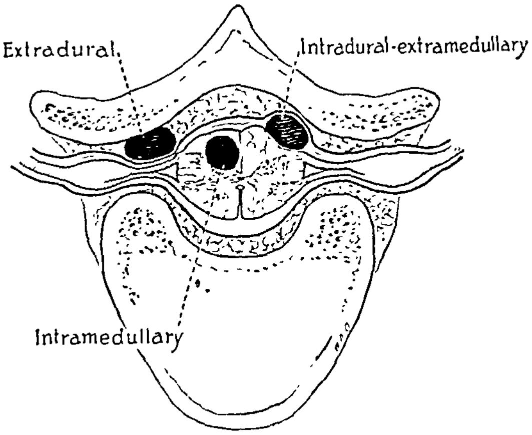

Fig. 1.—Clinicosurgical classification of spinal cord tumors.

Sensory Involvement.—The sensory involvement produced by protruded lumbar disks involves generally only a portion of one dermatome and is most often only subjective in nature. If sensory loss is marked or widespread, a cause other than protruded disk should be sought.

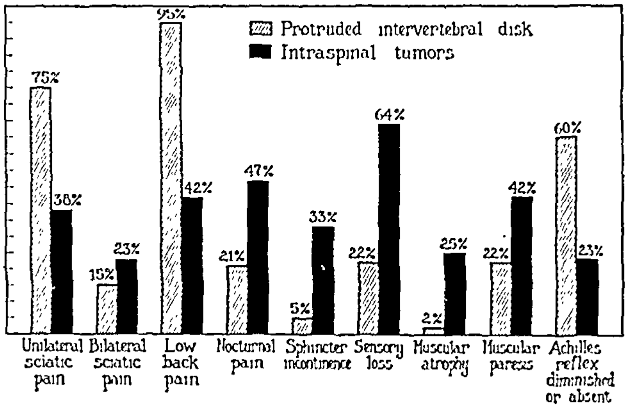

Fig. 2.—Comparison of incidence of various symptoms and signs in 154 cases of protruded intervertebral disk and 154 cases of tumor of the cord.

Overlapping of Signs and Symptoms.—In an effort to determine whether there are any unequivocal pathognomonic signs or symptoms of either lumbar protruded disks or of spinal cord tumors arising from the level of the 10th thoracic vertebra and below, two of us (W. McK. C. and J. D. C.) with Shelden [1] analyzed the records of 154 patients with proved tumors of the spinal cord and 154 patients with proved protrusion of lumbar disks. The results are given in figure 2. It is evident from this analysis that spinal cord tumors in some instances do produce symptoms and signs that occur characteristically in cases of protruded lumbar intervertebral disks. It is also evident that some of the symptoms and signs ascribed commonly to tumors of the spinal cord are present in some cases of protruded intervertebral disks in the lumbar region.

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[1] Craig, W. McK.; Camp, J. D., and Shelden, C. H.: Unpublished data.

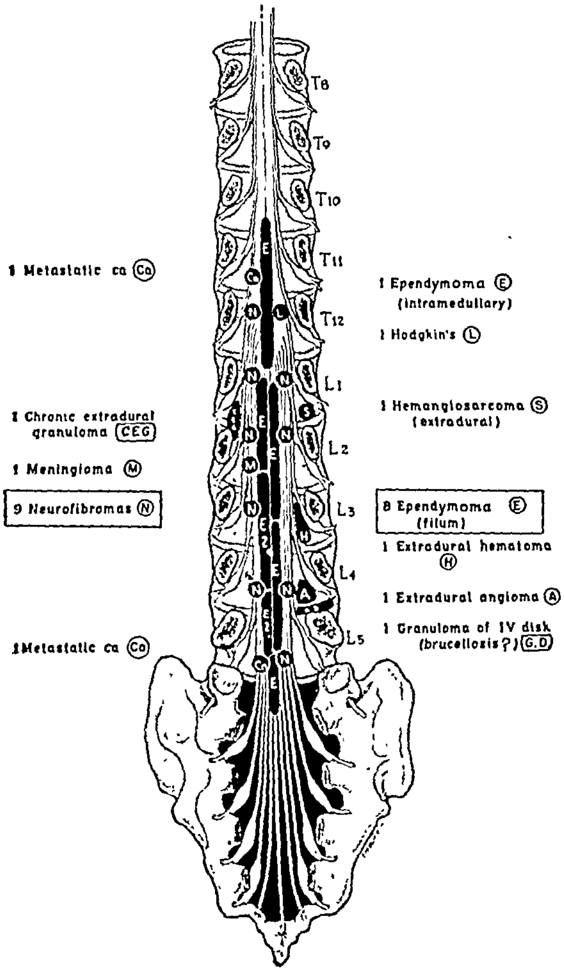

Fig. 3.—Type and location of 27 intraspinal tumors in which diagnosis of protruded lumbar intervertebral disk was entertained.

Roentgenographic Examination.—Suffice it to say here that changes indicative of erosion secondary to direct pressure from benign tumors and invasive destruction caused by primary malignant or metastatic malignant lesions must be carefully searched for in original roentgenograms.

Intraspinal Investigation.—The importance of intraspinal investigation, for example, analysis of spinal fluid, and contrast myelographic studies or, in some cases, differential spinal puncture, is indicated by the results of the following analysis.

ANALYSIS OF CASES

In the two years from Jan. 1, 1947, through December, 1948, a total of 1,296 patients were operated on at the clinic for intraspinal lesions situated at the level of the 10th thoracic vertebra or lower. Of this number, 51 patients had tumors and three had arachnoiditis (see accompanying table). Of the 51 who had tumors, 24 gave evidence of tumors from the outset. In 20 of the remaining 27 cases, the presumptive diagnosis made from the initial history and neurological, orthopedic, and roentgenographic examination was protruded lumbar intervertebral disk. In the remaining seven cases, although a working diagnosis of protruded disk was made, the possibility that the lesion might be an intraspinal tumor was entertained. The chief reasons for including the alternate diagnosis of spinal cord tumor were one or a combination of the following features: (1) history of night pain, (2) presence of marked scoliosis or kyphoscoliosis, and (3) presence of primary malignant lesion elsewhere in the body (fig. 3).

In all but five of the 27 cases in which the diagnosis of protruded lumbar intervertebral disk was entertained, the results of study of the protein in the cerebrospinal fluid immediately aroused suspicion of cord tumor. The concentration of protein in the cerebrospinal fluid ranged between 120 and 10,000 mg. per 100 cc. It has been our experience that, if more than 100 mg. of total protein is found in the cerebrospinal fluid, the offending lesion is considered to be a spinal cord tumor until proved otherwise. In the five cases in which the concentration of total protein was 100 mg. or less, the lesions were as follows: extradural angioma, granuloma of a disk (question of brucellosis), extradural angiosarcoma, metastatic carcinoma from the prostate, and ependymoma of the filum terminale.

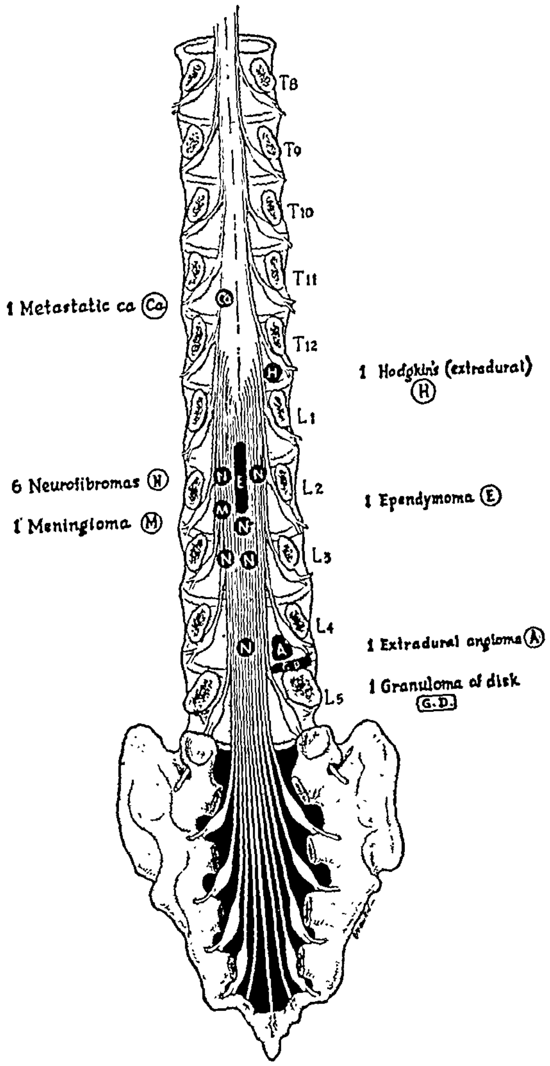

Fig. 4.—Type and location of 12 intraspinal tumors in which neurological examination disclosed nothing abnormal.

In all of these 27 cases, contrast myelography with air or radiopaque oil was employed. By this means a diagnosis of intraspinal tumor was established in all but four cases. In two of these four cases, the results of myelographic studies were atypical for protruded intervertebral disk and suggested, but did not establish, the diagnosis of tumor. In the remaining two cases, a case of granuloma of the intervertebral disk and a case of extradural metastatic carcinoma, the diagnosis made as a result of contrast myelographic studies was protruded intervertebral disk. However, with the lesion accurately localized by contrast myelographic studies, the true diagnosis was established at operation. In 12 of the 51 cases of intraspinal tumor in this series, there were no sensory, motor, sphincter, or reflex changes (fig. 4).

In this study we also encountered three cases of arachnoiditis. In two of these cases a presumptive diagnosis of spinal cord tumor was made from the history and general, neurological, and orthopedic examinations. In the third case, the patient complained only of low back pain and unilateral sciatica. The neurological examination disclosed nothing abnormal, and in this case a working diagnosis of protruded intervetebral disk was made and intraspinal investigation was carried out. The value for total protein in the cerebrospinal fluid was 20 mg. per 100 cc. Myelographic studies with ethyl iodophenylundecylate (pantopaque®) revealed partial block to the cephalad flow of oil at the body of the first lumbar vertebra. This suggested the possibility of a spinal cord tumor. Exploration revealed arachnoiditis.

SUMMARY AND CONCLUSIONS

From study of 1,296 cases in which operation was performed at the Mayo Clinic for intraspinal lesions at or below the level of the 10th thoracic vertebra, it is evident that the symptoms and signs of spinal cord tumors that originate at the level of the 10th thoracic vertebra or lower may simulate those of the protruded lumbar intervertebral disk. In these instances the true nature of the lesion producing the signs and symptoms cannot be determined from the history and neurological, orthopedic, or simple roentgenographic examination. However, when intraspinal investigation, consisting of analysis of spinal fluid and contrast myelographic studies, is carried out, the presence of intraspinal tumor becomes evident and its location is established in most instances. In those instances in which intraspinal investigation does not establish the true nature of the lesion, myelographic study with a contrast medium does localize the lesion accurately. In this way the operation can be directed to the site of the lesion, and the proper diagnosis can be established at operation. By analysis of spinal fluid and contrast myelographic studies, a significant number of errors can be avoided.

DIAGNOSIS AND TREATMENT OF BELL'S PALSY

William Bierman, M.D., New York

In addition to inability to move the muscles of one side of the face, the patient with Bell's palsy may present other symptoms. The one most frequently encountered is pain; this may be experienced prior to, concomitantly with, or subsequent to the onset of paralysis. It may vary in intensity and duration from relatively mild and transient to, rarely, severe and persistent. The location of the pain can be auricular, postauricular or preauricular. When, during the performance of operations on the ears of patients who were conscious, I applied electric stimulation to the bony inner tympanic wall where the tympanic nerve (Jacobson's nerve) and some of its branches are located these patients complained of pain that was varyingly referred to the three regions mentioned. Another common symptom is epiphora, which may be due to ectropion and to increased secretion. Other eye disturbances include blurred vision and a burning sensation, occurring particularly after reading or watching motion pictures or television. Changes that occur in the mouth include variations in salivary secretion, loss of taste in the anterior two-thirds of the tongue, and drooling. Food collects between the buccal mucosa and the teeth. Tinnitus or hyperacusis rarely occur.

DIAGNOSIS AND PROGNOSIS

The simplest and most important diagnostic procedure is inspection. When involvement is complete, there is lack of ability to wrinkle the forehead, frown, wrinkle the nose, close the eye completely (the eyeball rolls upward and outward, showing the sclera), dilate the nostrils, show the teeth, or contract the lips on the involved side. Such efforts at contraction cause the features to be pulled toward the uninvolved side. The normal lines of the face become completely or partially erased.

Instrumental aids to diagnosis include electric testing and electromyography. Several techniques are available for determination of the sensitivity of the facial nerve and muscles to electric stimulation. Some of these are the use of interrupted galvanic and faradic currents, chronaximetry, and determination of strength duration curves. Erb indicated that if two to three weeks following the onset of a paralysis the faradic responses of the nerve and muscles are good and the muscles react briskly to galvanic stimulation, the involvement is mild and recovery will take place within an additional two to three weeks.[1] With moderate involvement a partial reaction of degeneration occurs, as demonstrated by diminished faradic and sluggish galvanic responses; recovery could come about within six to eight weeks. In the severe form, with faradic inexcitability and sluggish galvanic response, recovery, if it occurs, may take six to eight months. Normal chronaxie values (those well below 1 σ) indicate a mild attack and permit a prognosis of recovery within a

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Read before the Section on Physical Medicine and Rehabilitation at the One-Hundredth Annual Session of the American Medical Association, Atlantic City, June 14, 1951.

[1] Bauwens, P.: The Electrodiagnostic Aspect of Facial Paralysis, Proc. Roy. Soc. Med. 43:754 (Oct.) 1950.

few weeks. If the chronaxie values are higher than 1 σ the paralysis may continue for months.

Electromyographic examinations confirm clinical observations and also permit more detailed analysis of the nature of the paralysis. In mild cases, there is only a reduction in motor unit activity in response to maximal voluntary effort, and recovery takes place within a few weeks. Fibrillation potentials occur in cases of denervation. Motor units of recovering patients produce polyphasic potentials. As with other electric techniques, it may not be possible with this method to differentiate between an axonal interruption and a reversible ischemic block for about 12 to 14 days after the nerve injury occurs. Feinstein observed that normal action potentials of the muscles of the face are of 2 to 5 milliseconds duration and of 50 to 500 μv. in amplitude. These values are smaller than the normal values for the large muscles of the limbs.[2]

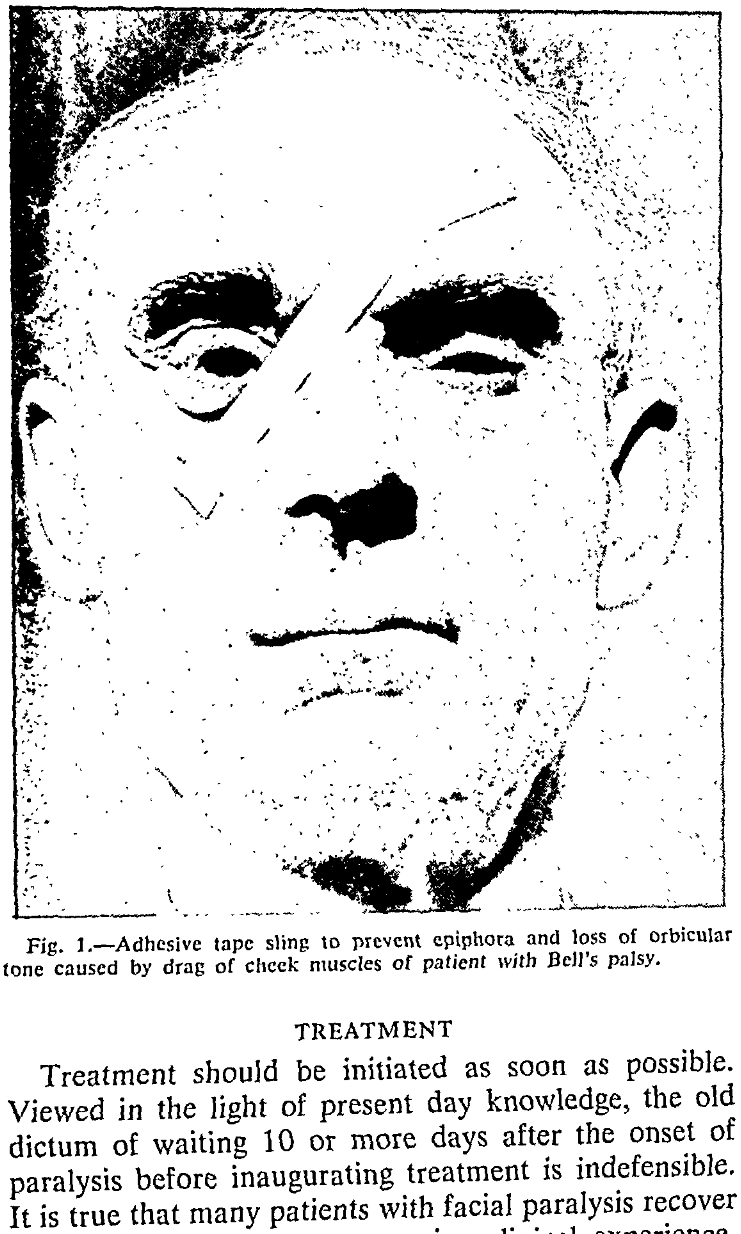

Fig. 1.—Adhesive tape sling to prevent epiphora and loss of orbicular tone caused by drag of cheek muscles of patient with Bell's palsy.

TREATMENT

Treatment should be initiated as soon as possible. Viewed in the light of present day knowledge, the old dictum of waiting 10 or more days after the onset of paralysis before inaugurating treatment is indefensible. It is true that many patients with facial paralysis recover spontaneously; however, extensive clinical experience, as well as experimental determinations by many workers, indicate that if proper treatment is promptly initiated patients with mild paralyses may recover in an abbreviated period, and some of those with severer involvement may be saved from permanent disfigurement. Treatment of Bell's palsy involves the same considerations as treatment of any other damaged lower motor neurone, plus the special considerations arising from the unique characteristics of the facial muscles. Unlike the muscles of the extremities, in which contraction of agonists is accompanied by relaxation of antagonists, bilateral muscles of the face contract simultaneously in normal expression.

The purpose of physical therapy for Bell's palsy is to minimize atrophic alterations that follow damage to the facial nerve. To accomplish this most effectively, treatment should be started as early in the disease as possible, since atrophy takes place most rapidly in the early stage of denervation. The therapeutic measures available include immobilization, application of heat, electric and reflex stimulation of muscles, massage, exercise, and reassurance and advice to the patient concerning his daily activities.

Immobilization.—The value of immobilization becomes clear when the effect of motion on the involved muscles is considered. "Facial expression is evidently a reflex action of high complexity in which the highest cortical centers are involved. Certain impulses arising in association centers reach the facial area of the motor cortex, and when sufficiently strong they seemingly release, against our will, motor impulses to the mimetic muscles. While a person is awake, the mimetic muscles like the rest of the voluntary system are kept in a state of tonus, ready to contract at any time. Yet the intensity of tonus varies according to the state of attention of mind." [3] Ordinarily the muscles of both sides of the face contract simultaneously. It is questionable whether the muscles of the opposite side of the face relax completely when an effort is made at unilateral contraction. In Bell's palsy, unfortunately for the patient, every attempt at motion, such as talking, eating, and registering emotion, result in the paralyzed muscles being pulled toward the uninvolved side. That such stretching is harmful is indicated by the experiments of Eisenhauer and Key,[4] who, working with the gastrocnemius-soleus group of muscles in cats, found that atrophy from disuse is severer in stretched muscles than in those maintained in the relaxed or neutral position. Pickerill and Pickerill [5] consider that the chief factor in lack of recovery from what should be temporary paralysis of the facial muscles is the immediate and continued overstretching of the paralyzed muscles by the normal muscles of the opposite side of the face. They noted that if means to prevent stretching of the muscles was applied directly after purposeful cutting of the facial nerve during removal of a parotid tumor the muscles lost surprisingly little tone during the three week interval before plastic surgery (consisting of fascia lata and muscle grafts) was performed, in contrast to greater loss of tone in muscles for which no such care was taken to avoid stretching.

To minimize stretching of the paralyzed muscles the patient is instructed to avoid facial movements as much as feasible. Thus he is told to talk through his teeth and to maintain a "poker face." Mechanical aids are helpful;

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2. Feinstein, B.: The Application of Electromyography to Affections of the Facial and the Intrinsic Laryngeal Muscles, Proc. Roy. Soc. Med. 39:817 (Oct.) 1946.

3. Huber, E.: Evolution of Facial Musculature and Expression, Baltimore, Johns Hopkins Press, 1931.

4. Eisenhauer, J., and Key, J. A.: Studies on Muscle Atrophy: Method of Recording Power in Situ and Observations on Effect of Position of Immobilization on Atrophy of Disue and Denervation, Arch. Surg. 51: 154 (Oct.) 1945.

5. Pickerill, H. P., and Pickerill, C. M.: Early Treatment of Bell's Palsy, Brit. M. J. 2:457 (Oct. 6) 1945.

in our experience the most satisfactory one is a sling that holds up the lower eyelid and the sagging muscles (fig. 1). Two strips of scotch tape or adhesive tape, each about ¼ in. (0.64 cm.) wide and about 3 in. (7.62 cm.) long are applied for this purpose. Starting about 1 in. (2.54 cm.) below the eye, toward its outer side, one strip is placed diagonally across the region between the inner canthus and the nose and is attached to the forehead. The other strip crosses the first as it is extended from the area below and toward the medial side of the eye to the region lateral to the eye and continues to the outer side of the forehead. The lower lid and the face are pulled upward before the strips are anchored to the forehead. These strips can be removed at night and occasionally during the day and can be placed in adjacent skin areas to avoid irritation. This technique, which helps to hold the lower lid in apposition to the eye, is designed to prevent both epiphora and loss of orbicular tone caused by the drag of cheek muscles.

Another good technique suggested by the Pickerills aims at counteracting the medial pull caused by contraction of the contralateral normal muscles. "The lower half of the paralysed side is first smeared thinly with vaseline or oil. Two strips of half- or three-quarter-inch strapping are then applied to the clean sound side on a level with the upper and lower lips, starting about three-quarters of an inch in front of the ear. The sound side is pushed across to the paralyzed side, and while in this position the other ends of the strapping are firmly stuck down to the mastoid process on the paralyzed side." My patients will not tolerate this technique, and I resort to the use of a plastic-covered wire bent to engage the outer corner of the mouth and to loop over the ear. While not as therapeutically satisfactory, this device has the advantage of ready removability and replacement. A better device, which is also cosmetically superior, is the removable intraoral splint constructed by Allen and Northfield.[6]

Heat.—The value of warming the face can be readily demonstrated in the patient who has a paretic muscle and who has just come in from the cold outdoors. Prior to the application of heat no muscle movement may be discerned, while directly afterward such motion may be obvious. Experiments performed by Asmussen and Boje [7] showed that a muscle functions better when warmed. Bowden and Gutmann [8] did biopsies on denervated muscles and observed that blood vessels had become dilated and collections of red blood corpuscles and polymorphonuclears could be seen outside them, indicating circulatory stasis. The hyperemia-producing effect of heat [9] may help to minimize this circulatory deficiency. I have found it convenient to use radiant heat for a period of about twenty minutes as a preliminary measure to other therapy.

Electric Stimulation.—It is my impression, gained from treating a large number of patients over a period of many years, that electric stimulation is important in the treatment of Bell's palsy. Such stimulation should be applied as early as possible, even before a reaction of degeneration is demonstrable. Observations made by many experimental workers substantiate this conclusion based on clinical experience. For electric stimulation I use an interrupted current having a square wave form. The active electrode is the cathode. It is convenient to use an automatic interrupter because it permits both hands to be free; one to transfer the stimulating electrode from muscle to muscle and to hold it in position for the duration of several contractions and the other to regulate the potentiometer so that the minimal amount of current strength is applied to secure a vigorous muscle contraction. Kosman and his co-workers consider that the best type of electric current for muscle stimulation is a 25 cycle sinusoidal current. Application of electric current as a substitute for the absent voluntary impulses should be done daily if possible.

Reflex Stimulation.—The motor nucleus of the facial nerve receives fibers from the corticobulbar tract of the same and opposite sides and also fibers from the lateral trigeminus and medial lemniscus and from the spinothalamic tracts. Through these connections reflex facial movement in animals may be initiated from various receptive areas of the body.[10] For patients with Bell's palsy I use the blue pencil effluve from a static machine to evoke, if possible, a reflex action. This application is mildly irritating, and, like a fly alighting on the face or like the brush of a feather (which has been used for the purpose), can produce contraction of the facial muscles. The explanation of this phenomenon is based on two postulations: 1. that a reflex pathway exists between the trigeminal and facial nerves, and 2. that a contractable muscle exists even when visible evidence of voluntary movement is absent; the latter can be shown to be true electromyographically.

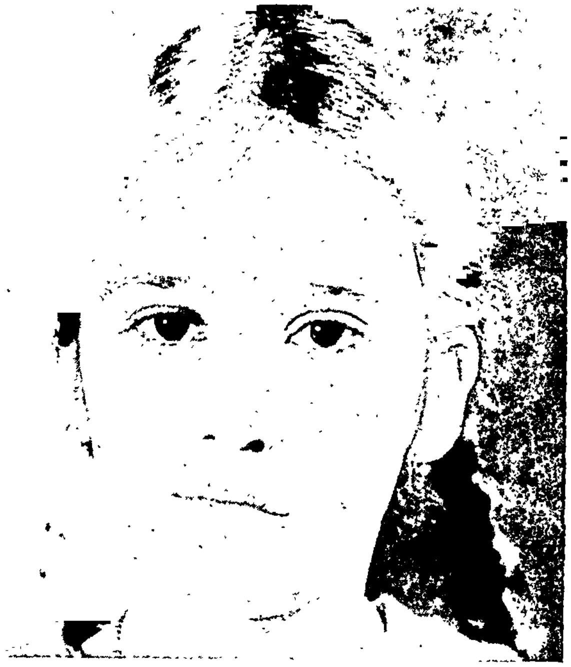

Fig. 2.—Residual distortion of features, with face in repose, of 10-year-old girl who had Bell's palsy in the left side of the face when 8 days old.

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[6] Allen, A. G., and Northfield, D. W. C.: An Intra-Oral Splint for Facial Palsy, Brit. Dent. J. 79: 213 (Oct. 19) 1945.

[7] Asmussen, E., and Boje, O.: Body Temperature and Capacity for Work, Acta physiol. Scandinav. 10: 1, 1945.

[8] Bowden, R. E. M., and Gutmann, E.: Clinical Value of Muscle Biopsies, Lancet 2: 768 (Dec. 15) 1945.

[9] Bierman, W.: Physical Medicine in General Practice, ed. 2, New York, Paul B. Hoeber, Inc., 1947.

[10] Best, C. H., and Taylor, N. B.: The Physiological Basis of Medical Practice: A Text in Applied Physiology, ed. 5, Baltimore, Williams & Wilkins Company, 1950.

Exercise.—The best form of physical therapy for poorly functioning muscles is active exercise; however, it can only be used by patients who have some muscle tissue that is capable of contraction and that has a neural pathway to it over which the voluntary impulse can travel. In the face, there is an additional important consideration: the symmetrical contraction on the normal side should not cause a disproportionate pull that would stretch the weaker muscles on the involved side. In the region of the forehead and the eye, there is little danger of stretching the weak muscles, but this possibility should be avoided in contractions of the nose, cheek, lips, and chin. If necessary, the muscles on the normal side should be restrained manually. The patient should not be requested to exercise until he shows himself capable of meeting the requirement mentioned; however, it is not necessary that he be made to wait until all muscles begin to function. When permitted to do so, he should exercise several times a day, preferably in front of a mirror. Exercises should be performed as early as possible. Certain positions during exercise may be more advantageous than others, as, for example, a patient may not be able to move the orbicularis oculi satisfactorily while he is in the upright position but can do so in the supine position. Contractions about the mouth may be observed by having the patient "swallow hard." Movement in the muscles about the mouth may be observed as the patient talks, even though he cannot elicit isolated motion in these muscles on request.

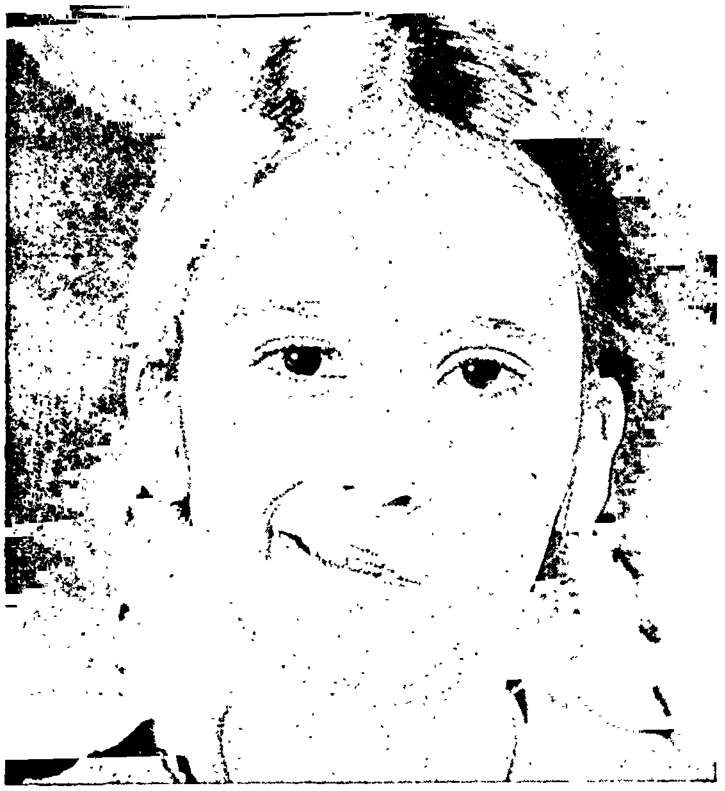

Fig. 3.—Asymmetrical smiling in girl shown in fig 2.

Inadequate exercise is particularly dangerous for children with facial paralysis. Even though voluntary control of the involved facial muscles is soon reestablished, the symmetrical character of these contractions may be lost. This may be due to disproportionate growth of the muscles or to the development of faulty habit patterns. It is difficult to impress a child with the importance of exercise (fig. 2, 3, and 4).

Massage.—Massage, if used, should be applied to paralyzed muscles with very mild pressure, as in effleurage. In the face, particularly, where a bony surface lies only a short distance beneath the muscles, there is danger of mechanical traumatization.

General Considerations.—The patient will often ask questions regarding daily activities, in addition to those concerning diagnosis and prognosis. He should be told to avoid eye-strain from reading and looking at motion pictures. Some patients are helped by wearing colored glasses or an eye shield, particularly if they have marked ectropion. Washing the eye with boric acid solution will help allay irritation. Chewing can be done on either side of the mouth, inasmuch as the masseter and buccinator muscles are not involved, but the patient may prefer to do most of his chewing on the normal side because food collects between the teeth and cheek on the paralyzed side. Some patients find they can chew best when they pull the involved cheek upward toward the ear with one hand. The answer to the question "Shall I go to work?" depends on the nature of the work. The preoccupation of activity is good for the patient's morale, but it should not be of a type that requires constant use of the facial muscles, such as talking. Drafts should be avoided.

Psychic Considerations.—Too often the physician neglects the fact that his patient is a human being needing reassurance to allay fears engendered by his intellectual and emotional reactions to his condition. The patient receives some reassurance when informed that his condition is not due to a stroke, but he is still disturbed by what appears to be a calamitous state. Advice that the condition should be left alone for ten days because it may clear up spontaneously, gives him a dubious sense of comfort, which disappears entirely if, as is true in many instances, the paralysis is still present at the end of that time. Furthermore, this approach is wrong, because immediate treatment is necessary. If the patient's face is closely scrutinized at every visit, slight evidence of improvement may be detected: there may be diminution of distortion when the face is at rest; the nasolabial fold may become evident; lines may appear beneath the eyes or under the lower lip; the corner of the mouth may deepen; and there may be slight observable contraction of various muscles. Knowledge of this encouraging objective information as well as of that determined from chronaxie and electromyographic studies greatly uplifts the patient's morale. With this approach, the patient may be given considerable relief from torturing fears and doubts during the period of palsy.

Medication and Surgery.—Antibiotics and vitamin B have been prescribed for the patient with Bell's palsy, but their value has not yet been demonstrated. Encouraged by results of their experiments on monkeys, Ballance and Duel [11] have recommended that in patients partially recovered from Bell's palsy the nerve in the fallopian aqueduct be uncovered at an early date and be decompressed by incision of the sheath. Other surgeons have advocated this procedure also.[12] Josephine Collier [13] has published a critical review of the value of the decompression operation. She states, "The belief that decompression performed say eight to ten weeks after onset of paralysis has been responsible for the recovery of movement in a few days does not take account of the rate at which regeneration occurs. Such cases are probably one of reversible ischemic block or of mixed character. . . . If fibrillation action potentials are absent or few in number or if motor units are obtained on insertion of the needle, operation on the nerve is not justified. Since I have had the assistance of electromyography I have not seen any case of Bell's palsy that called for decompression. There are occasional cases that remain permanently paralysed. I am inclined to think that these patients with persisting paralysis should be treated by a combination of facial-hypoglossal anastomosis and plastic surgery. All cases should have physiotherapy from the onset."

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[11] Ballance, C., and Duel, A. B.: Operative Treatment of Facial Palsy by Introduction of Nerve Grafts into Fallopian Canal, and by Other Intratemporal Methods, Arch. Otolaryng. 15:1 (Jan.) 1932.

[12] Morris, W. M.: Surgical Treatment of Bell's Palsy, Lancet 1:429 (Feb. 19) 1938.

CLINICAL RESULTS

Clinical results must be the final criterion of the value of treatment for Bell's palsy. The table shows the time required for recovery in 100 patients in whom treatment was begun within two weeks of the onset of paralysis. The patients are classified into two groups according to type of initial therapy given, with 55 receiving treatment A and 45 receiving treatment B. Treatment A consisted of daily application during the first two weeks of radiant heat and static brush discharge. Patients who still showed signs of paralysis at the end of two weeks were treated with radiant heat and interrupted galvanic current three times weekly. Treatment B consisted of the application of radiant heat and massage every other day during the first two weeks; subsequently, interrupted galvanic stimulation and exercise were administered three times a week. All patients were given a supporting device consisting of a curved wire hooked onto the corner of the mouth and over the ear on the paralyzed side. The results shown in the table clearly indicate that patients receiving daily treatment during the first two weeks with heat and static brush and subsequently with interrupted galvanic stimulation recover more rapidly than do those who are treated initially with heat and massage every other day and later with interrupted galvanic stimulation. Not all patients made a complete recovery; in a few, some residual weakness persisted for a long time.

SEQUELAE TO BELL'S PALSY

With relatively severe involvement (persistence of palsy for more than three months) abnormal phenomena may appear. These include the occurrence of associated movements, contractures, spontaneous muscle contractions, and exaggerated reflex irritability. The gustolacrimal reflex and the auriculotemporal syndrome are observed infrequently. The pathological gustolacrimal reflex is usually transient and consists of a flow of tears from the homolateral eye when gustatory stimuli reach the anterior part of the tongue. The auriculotemporal syndrome may be seen after incomplete recovery from facial nerve palsy and is characterized by redness of the skin and increased perspiration in the area innervated by the auriculotemporal nerve. Guttmann's [14] explanation for this phenomenon is that the vasodilator and secretory fibers supplying the affected area are released from sympathetic control.

In associated movements all muscles on the involved side of the face contract when effort is made to move one or a limited number of muscles. Lipschitz [15] thought this was due to a misdirection of regenerating fibers growing indiscriminately from the central part of the injured nerve into the peripheral part, crossing and recrossing each other's pathways and mutually intruding into each other's channels. Many others subscribed to this explanation. Wartenberg [16] made a critical and intensive analysis of this hypothesis and concluded that if these associated movements are regarded as a release phenomenon due to a central lesion, all the pertinent clinical facts can be more readily understood. He noted a striking similarity between the condition due to lesions of the pyramidal tracts, as seen in cases of spastic paralysis, and the condition in the muscles of the facial nerve after partial recovery from palsy.

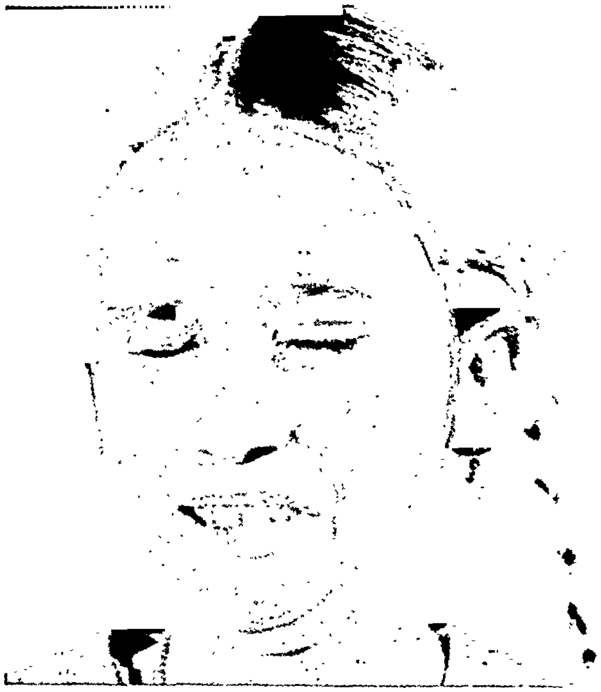

Fig. 4.—Contractions of left side of face achieved with special effort in girl shown in fig 2.

The patient who is initially concerned with the increase in the width of eye showing between his lids becomes equally disturbed when he finds that, following narrowing of the palpebral fissure, his eye appears smaller. Such contractures become evident in other facial muscles as well. I have attempted to treat contractures of facial muscles in various ways, none of them completely satisfactory. The techniques I have employed include active, passive, and assistive stretching exercises, heat in various forms, iontophoresis variously with magnesium sulfate, curare, and neostigmine. I now apply ultra sound. When a case of palsy continues for more than sev-

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13. Collier, J.; Spillane, J. D., and Bauwens, P.: Symposium: The Treatment of Facial Paralysis, Proc. Roy. Soc. Med. **43**: 746 (Oct.) 1950.

14. Guttmann, L.: Die Schweissekretion des Menschen in ihren Beziehungen zum Nervensystem, Ztschr. f. d. ges. Neurol. u. Psychiat. **135**: 1, 1931.

15. Lipschitz, R.: Beitrage zur Lehre von der Facialislahmung nebst Bemerkungen zur Frage der Nervenregeneration, Monatschr. f. Psychiat. u. Neurol. (supp.) **20**: 84, 1906.

eral weeks, I anticipate the possibility of visible contracture formation and use ultra sound. My experience with this measure in the late and after care of Bell's palsy is too recent to permit me to reach a conclusion as to its value other than to consider it worthy of further trial.

SUMMARY

Clinical and laboratory evidence is presented to indicate that it is possible to influence the course of Bell's palsy. This influence is exerted on tissue altered by damage to its motor nerve supply. It is important to apply treatment immediately. The rationale for the indicated therapeutic procedures is based on an understanding of the pathological nature of the disease and of its symptoms as determined by clinical and instrumental criteria. The measures recommended for the care of Bell's palsy include immobilization, heat, electric and reflex stimulation, and exercise. Attention is called to the sequelae of Bell's palsy.

Recovery Time in 100 Patients with Bell's Palsy Treated Within Two Weeks After Onset

	Treatment A *			Treatment B †		
		Percentage			Percentage	
Recovery Time, Weeks	Number of Patients	of Group	Cumulative	Number of Patients	of Group	Cumulative
1	2	4	..	0	..	..
2	20	35	39	9	20	..
3	4	7	..	3	7	..
4	13	23	69	5	11	38
6	2	4	..	3	7	..
7	2	4	..	3	7	..
8	5	9	..	7	16	..
12	2	4	90	2	4	72
17	1	2	..	6	14	..
21	2	4	..	1	2	..
26	2	4	100	2	4	92
30	..	..	..	1	2	..
34	..	..	..	1	2	..
39	..	..	..	1	2	..
48	..	..	..	1	2	100
Total	55			45		

* Daily application during the first two weeks of splinting, radiant heat, and static brush discharge and, subsequently, application three times a week of radiant heat and interrupted galvanic current.

† Application every other day during the first two weeks of splinting, radiant heat, and massage and, subsequently, application three times a week of interrupted galvanic current and exercise.

471 Park Ave.

16. Wartenberg, R.: Associated Movements in the Oculomotor and Facial Muscles, Arch. Neurol. & Psychiat. 55: 439 (May) 1946.

Courtesy Calls.—It is not only rational but essential for a doctor settling in a new place to call on the other doctors there because he is going to be one of them. And he should make himself known as agreeably as possible, not as if he expected them to hand over their practices, but as one man talking to others in as modest a way as possible, not boasting of his advantages or ability in any particular line, or the advance of medicine in which he has participated, because after all those things smack of the freshman, no matter how true they seem. And from the very beginning you should get on good and friendly terms with the other doctors. That is very often not done, and always with unfortunate results. People working in the same profession ought to work together; if any man from the beginning makes up his mind that he is going to be friendly and forbearing rather than otherwise, things will be very much better.—George Dock, Medical Ethics and Etiquette, 1906, quoted in Dr. Robert Coope, The Quiet Art, Edinburgh, E. & S. Livingstone Ltd. (Baltimore, Williams & Wilkins Co.), 1952, p. 224.

CLINICAL NOTES

CONGENITAL METHEMOGLOBINEMIA SIMULATING TRICUSPID ATRESIA

REPORT OF A CASE

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Egbert H. Fell, M.D.
Raul Casas, M.D., Chicago
and
Raul Pereiras, M.D., Havana, Cuba

Congenital methemoglobinemia is one of the rare causes of generalized cyanosis. A thorough review of the literature reveals only 30 reported cases, 19 verified [1] and 11 doubtful.[2] The following case is reported because of the rarity of this condition and because the findings simulated those present in tricuspid atresia.

REPORT OF CASE

A five-month-old male Cuban infant was recently referred to us with the following history: The baby was delivered by a cesarean section, but the delivery was otherwise uneventful. The birth weight was 7 lb. 12 oz. (3,515 gm.). Cyanosis was noted on the second day after delivery. The baby was given oxygen and kept in an oxygen incubator for 12 days. The cyanosis did not improve. Because of a systolic murmur over the base of the heart and a left axis deviation of the electrocardiogram, a diagnosis of probable tricuspid atresia was made by the attending physician, and the patient was sent to Chicago for possible surgical intervention.

Examination revealed a markedly cyanotic, very irritable infant. The cyanosis was especially marked on the lips, fingers, toes, and mucous membrane of the mouth and eyes. He weighed 14 lb. 8 oz. (6,577 gm.) and was 28 in. (71.1 cm.) tall. There was no clubbing of the fingers. The blood pressure was 90/60 in the upper extremities. The femoral pulsations were normal. The heart was not enlarged on percussion. The apex beat was in the

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From the Hektoen Institute for Medical Research, the Children's Division of Cook County Hospital, and Mount Sinai Hospital, Chicago.

1. (*a*) Slosse, A., and Wybauw, R.: Un cas de méthémoglobinémie idiopathique, Ann. et Bull. Soc. roy. d sc. méd. et nat. de Brux. **70**: 206, 1912. Dieckmann, W. J.: Methemoglobinemia, Arch. Int. Med. **50**: 574, 1932. Hitzenberger, K.: Autotoxische Zyanose (Intraglobuläre Methämoglobinämie), Wien. Arch. f. inn. Med. **23**: 85, 1932. Van Lier, H. W.: Over de Parhaemoglobinaemieen, Utrecht, These, 1933. van Thienen, G. J.: Methemoglobinemia, Nederl. tijdschr. v. geneesk. **77**: 1086, 1933. Van Heukelom, S.: Intraglobulaire congenitale familiaire methemoglobinaemia, Geneesk. tijdschr. v. Nederl.-Indië. **77**: 3054, 1937. Lian, C.; Frumusan, P., and Sassier: Méthémoglobinémie congénitale et familiale: Action favorable de l'acide ascorbique, Bull. et mém. Soc. méd. d. hôp. de Paris **55**: 1194, 1939. Deeny, J.; Murdock, E. T., and Rogan, J. J.: Familial Idiopathic Methaemoglobinaemia, with Note on Treatment of 2 Cases with Ascorbic Acid, Brit. M. J. **1**: 721, 1943. King, E. J.; White, J. C., and Gilchrist, M.: Case of Idiopathic Methaemoglobinaemia Treated by Ascorbic Acid and Methylene Blue, J. Path. & Bact. **59**: 181, 1947. Graybiel, A.; Lilienthal, J. L., Jr., and Riley, R. L.: Report of Case of Idiopathic Congenital and Probably Familial Methemoglobinemia, Bull. Johns Hopkins Hosp. **76**: 155, 1945. Sievers, R. F., and Ryon, J. B.: Congenital Idiopathic Methemoglobinemia: Favorable Response to Ascorbic Acid Therapy, Arch. Int. Med. **76**: 299, 1945. (*b*) Eder, H. A.; Finch, C., and McKee, R. W.: Congenital Methemoglobinemia: Clinical and Biochemical Study of Case, J. Clin. Investigation **28**: 265, 1949. (*c*) Baltzan, D. M., and Sugarman, H.: Hereditary Cyanosis, Canad. M. A. J. **62**: 348, 1950.

2. (*a*) Litarczek, G.; Aubert, H., and others: Sur un cas de cyanose autotoxique par méthémoglobinémie intraglobulaire, Sang **4**: 188, 1930. (*b*) Miller, R.: Case of Enterogenous Methaemoglobinaemia (Congenital)? in Child, Arch. Dis. Childhood **5**: 73, 1930. (*c*) Leiner, G., and Minibeck, H.: Ein Fall von intraglobulärer methaemoglobinaemie, Wien klin. Wchnschr. **48**: 1547, 1935. Bensley, E. H.; Rhea, L. J., and Mills, E. S.: Familial Idiopathic Methaemoglobinaemia, Quart. J. Med. **7**: 325, 1938. (*d*) Schwartz, A. S., and Rector, E. J.: Methemoglobinemia of Unknown Origin in 2 Week Old Infant, Am. J. Dis. Child. **60**: 652, 1940. (*e*) Gibson, Q. H., and Harrison, D. C.: Familial Idiopathic Methaemoglobinaemia, Lancet **2**: 941, 1947.

fifth interspace, just outside the midclavicular line. The rhythm was normal, and there was a grade 2 soft systolic murmur over the pulmonary area. Fluoroscopic and x-ray examinations revealed a wide base, which was interpreted as an enlarged thymus gland. The vascular pulmonary markings appeared normal (fig. 1). The right oblique view showed a slight posterior displacement of the esophagus in the region of the left auricle, and the chest on the left oblique view was considered normal, with possible enlargement of the inflow tract of the left ventricle.

The electrocardiogram (fig. 2) revealed a left axis shift in the standard leads, a horizontally shaped heart in leads AVL and AVF, and no evidences of heart strain in the unipolar leads. On roentgenograms the long bones appeared to be normal.

Examination of the blood revealed a hemoglobin level of 15.8 gm. per 100 cc. (102.6%), 5,440,000 red blood cells and 3,600 white blood cells. The differential count showed 21% segmented leukocytes, 78% lymphocytes, and 1% monocytes. The color index was 0.95. Fragility tests of the red blood cells revealed beginning hemolysis in a 40% sodium chloride solution and complete hemolysis in a 30% solution. The ascorbic acid content was 0.24 mg. per 100 cc. of blood. An arterial blood sample was examined by Dr. James Campbell of the Presbyterian Hospital, and the oxygen capacity was 8.37 vol. %, the oxygen content 4.13 vol. %, and the oxygen saturation 49.4 vol. %.

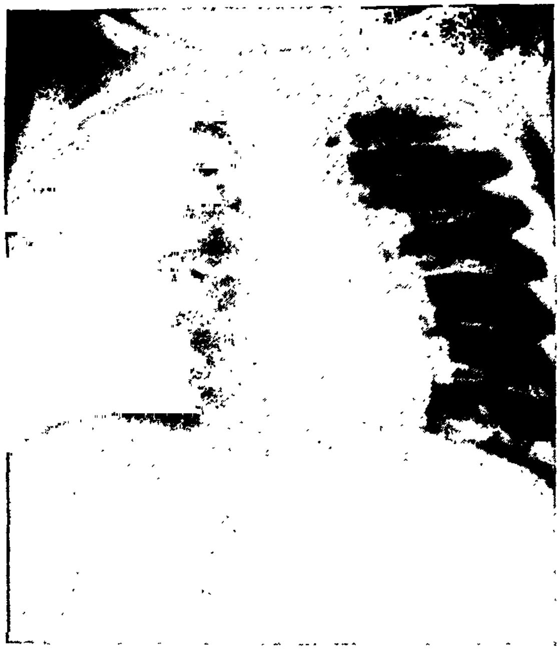

Fig. 1.—Roentgenogram of the heart. Note the wide base and normal vascular pulmonary markings.

Although the findings were consistent with a diagnosis of tricuspid atresia, the fluoroscopic appearance of the normal vascular pulmonary markings were inconsistent with the diagnosis of tricuspid atresia associated with pulmonary stenosis or atresia, and the normal size of the heart as well as the normal vascular pulmonary findings were also inconsistent with the diagnosis of tricuspid atresia associated with complete transposition of the great vessels.[3] Because of this discrepancy, an angiocardiogram was performed and no evidences of tricuspid atresia, interauricular septal defect, pulmonary stenosis, or transposition of the great vessels were found (fig 3).

Because there was no evidence of any congenital malformation of the heart that would produce cyanosis, or of an arteriovenous pulmonary aneurysm, the probable diagnosis of methemoglobinemia was then made. Since the baby did not take any medication and there was no history of drinking any well water or contact with any aniline dyes either at home in Cuba or in Chicago, the methemoglobinemia was thought to be of the primary, congenital type. In our anxiety to prove this diagnosis, we injected 5 cc. of a 1% methylene blue solution before a sample of blood had been withdrawn for determination of the methemoglobin content. Within 20 minutes the cyanosis had completely disappeared, and the baby appeared as pink as any other normal infant.

A sample of the arterial blood obtained 12 hours later revealed an oxygen saturation of 95.4%, with a methemoglobin content of 0.8% of the total hemoglobin (a normal finding).

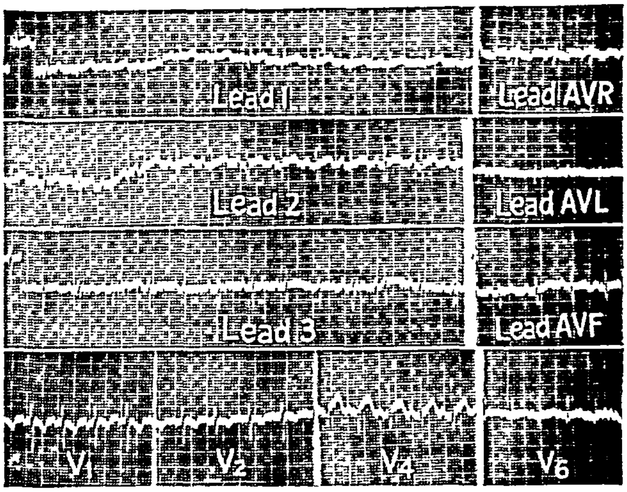

Fig. 2.—Electrocardiogram revealing a left axis shift in the three standard leads. Leads AVL and AVF reveal a horizontally shaped heart. There are no evidences of heart strain in any leads.

A blood count taken one week later showed a red blood count of 4,730,000 and a hemoglobin level of 12.3 gm. (78.8%). The soft systolic murmur disappeared, and the electrocardiogram still showed a horizontally shaped heart with a left axis shift.

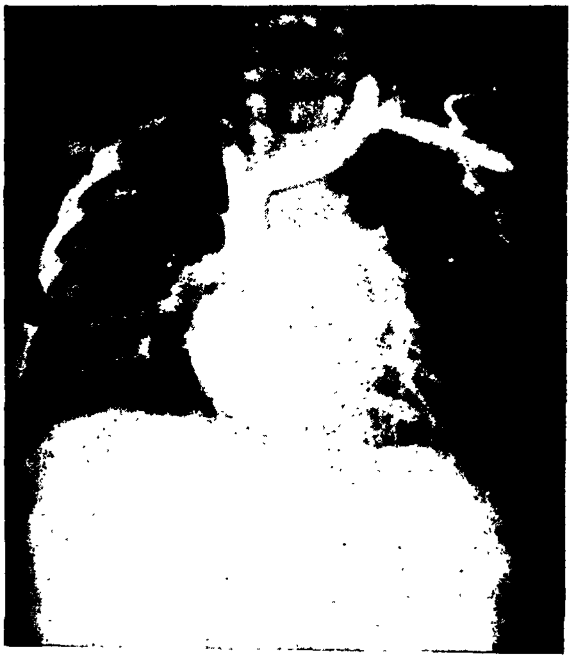

Fig. 3.—The dextroangiocardiogram shows a normal right auricle, right ventricle, main pulmonary artery, and right and left pulmonary branches, and no dextroposition of the aorta.

The methemoglobin content during the infant's stay in the hospital went up to 1.8%, 2.3%, and 3.5% of the total hemoglobin content. The blood count went up again to 5,860,000 red

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[3] Taussig, H. B.: Congenital Malformations of the Heart, New York, Commonwealth Fund, Division of Publications, 1947, pp. 79-93. Gasul, B. M.; Fell, E. H.; Mavrelis, W., and Casas, R.: Diagnosis of Tricuspid Atresia or Stenosis in Infants: Based upon Study of 10 Cases, Pediatrics, 6: 862, 1950.

INTESTINAL INFESTATION WITH MAGGOTS OF THE "CHEESE FLY" (PIOPHILA CASEI)

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Riley and Johannsen[1] state in their "Handbook of Medical Entomology" that a multitude of cases of parasitism of dipterous larvae are on record. However, in THE JOURNAL, we were able to find only one case of this kind reported in the last 25 years.[2] Descriptions and illustrations of myiasis-producing larvae are very scanty in laboratory handbooks. We report herein a case of human intestinal infestation with larvae of Piophila casei, the first one observed in our clinic.

REPORT OF A CASE

F. R. R., a 44-year-old contractor who had modern sanitary facilities in his home, was admitted to the hospital on July 30, 1951, with complaints of bowel disturbance. In 1944 he had attacks of severe pain in the abdomen, radiating to the back and downward to the left thigh. At this time he had noticed blood and mucus as well as small white "worms" in the stool. At the time of examination his appetite was good, but he slept poorly. He had lost 14 lb. (6.4 kg.) recently. During the previous few weeks he had again noticed small "worms" in the stool.

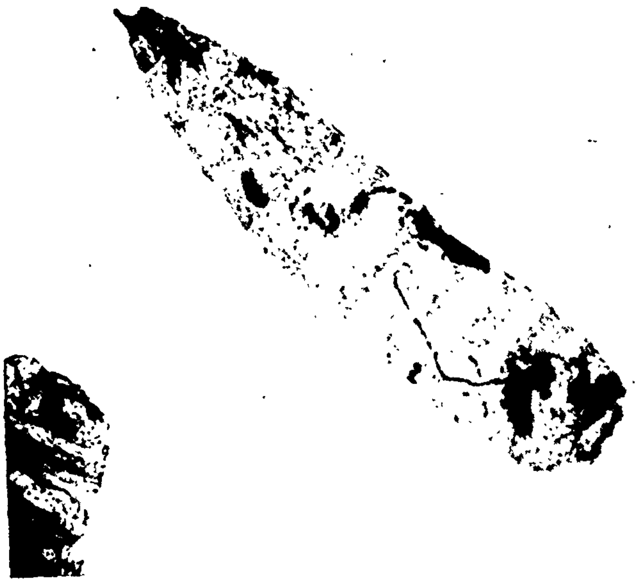
Fig. 1.—Larva of Piophila casei found in the stool. The broad extremity is the posterior end and the tapered one the head with mouth hooks. The stigmal plate with the breathing holes is seen at the lower left. (× 24.)

On admission his blood pressure was 130/70. The pulse rate was 72 per minute. No pathological changes were present in lungs, heart, nose, or throat. The urine was straw colored, clear, and alkaline. Specific gravity was 1.008, and there was no sugar or albumin. The hemoglobin was 86% (Sahli), and the white blood cell count was 7,850. The Kline reaction of the blood serum was negative. Proctoscopic examination showed a healthy mucous membrane, and no ulcers were seen. The soft brown stool that was brought to the hospital by the patient contained eight small whitish yellow, worm-like structures, which were alive and moving. They were between 3 and 5 mm. in length and about 0.5 mm. thick. Under the microscope, mouth hooks and 12 segments were seen. Each segment carried a crown of chitinous hairs. The mouth was equipped with deeply stained sharp hooklets. On the posterior end were two dark spots, the openings of the respiratory organs. These microscopic structures characterized the parasites as insect larvae. Preserved in 10% alcohol, they were submitted to Dr. H. Branch, entomologist at the University of Wichita. She identified the larvae as those of the "cheese fly," Piophila casei.

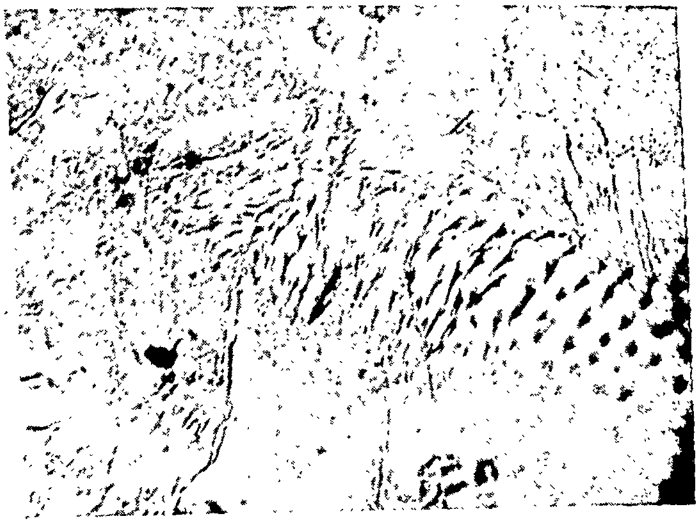
Fig. 2.—Chitinous hairs dividing segments. This structure is characteristic of insect larvae. (× 230.)

COMMENT

Piophila casei, the cheese fly, deposits its eggs not only in old cheeses but on fish, ham and bacon, and other smoked meats. The larvae are the well-known "cheese skippers." This species has been repeatedly reported as causing intestinal myiasis.

Thébauld[3] in 1901 described a girl who, shortly after consuming a large piece of cheese, became ill and experienced severe pains in the region of the navel. Later these extended through the whole abdomen. The feces was mixed with blood, and she experienced vertigo and severe headaches. During the following four days the girl felt no change, although the excretion of the blood gradually diminished and stopped. She passed two half-digested larvae on the fourth day and later seven or eight, of which two were alive and moving.

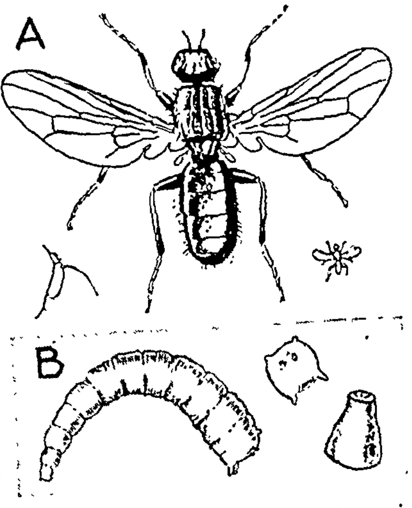

Fig. 3.—*A*, drawing of Piophila casei. *B*, larva. (From Riley and Johannsen.[1])

That these intestinal symptoms may be directly attributed to the larvae, or "skippers," has been shown by ample experimental evidence. Portschinsky[4] cited the case of a dog fed on cheese containing the larvae. The animal suffered much pain, and its excrement contained blood. At autopsy it

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[1] Riley, W. A., and Johannsen, O. A.: Handbook of Medical Entomology, Ithaca, N. Y., Comstock Publishing Co., Inc., 1915.

[2] Pumpelly, W. C.: Case of Human Infestation by Larvae of the Fly, Eristalis Tenex, J. A. M. A. 84:37 (Jan. 3) 1925.

[3] Thébauld, V.: Hémorrhagie intestinale et affection typhoide causées par des larves de diptère, Arch. de parasitol. 4:353, 1901.

[4] Portschinsky, T. A.: Biology of Stomoxys Calcitrans and Other Coprophagous Flies, Monograph in Russian, 1910, cited by Riley, W. A., and Johannsen, O. A.: Handbook of Medical Entomology, Ithaca, N. Y., Comstock Publishing Co., Inc., 1915, p. 137.

was found that the small intestine throughout almost its entire length was marked by bloody bruises. The papillae on these places were destroyed, although the walls were not entirely perforated. In the appendix two or three dead larvae were found. Austen[5] in 1912 recorded a case of myiasis of the nose, attended with pain and a profuse watery discharge of several weeks' duration, due to the larvae of Piophilia casei. Alessandri[6] in 1910 reported that the larvae are resistant to drugs and chemicals, that in many cases lesions and slight hemorrhages may occur, owing to the abrasive action of the mouth hooks, and that patients may experience colicky pains and headaches. It was said to be common among soldiers in military camps.

It seems likely that unmasticated larvae may survive in the human gastrointestinal tract, to be passed eventually with the stool. When large numbers of larvae are passed, the phenomenon is best explained by the previous ingestion of eggs. The principal question is, of course, whether maggots can adapt themselves to intestinal environments, survive, and even multiply, thus causing true intestinal myiasis.

Herys and Gilbert[7] described a woman who apparently had had intestinal myiasis for many years. The experiments of Kenney,[8] however, seem to refute this possibility. Kenney fed 60 men with living maggots of musca domestica, Calliphoria, and Sarcophaga in gelatin capsules, to avoid digestion in the stomach. Only 10 of his volunteers failed to have symptoms of gastrointestinal disturbances. Fifty of the volunteers had nausea, vomiting, intestinal cramps, and diarrhea, together or as separate symptoms, but all symptoms disappeared within 48 hours after the spontaneous elimination of the larvae. Of these larvae, only a few were found alive in vomitus and stools.

These findings seem to indicate that, though temporary gastrointestinal distress may follow the ingestion of such dipterous larvae as Musca domestica, Calliphora, and Sarcophaga, they do not produce true intestinal myiasis in man. Observations in our own case of intestinal infestation with the "cheese skipper" seem to support the view held by Kenney. Examinations of all stool specimens that our patient passed in the hospital failed to reveal any larvae, and his intestinal symptoms promptly cleared up. The patient was discharged from the hospital on Aug. 5, 1951, and returned home. Several days later he mailed to us another stool specimen, which again contained several larvae. He was instructed by his physician to protect his food from contamination by the "cheese fly."

CONCLUSIONS

A case of human intestinal myiasis with larvae of the Piophila casei is reported. The disappearance of the larvae from the stool shortly after the patient was removed from the source of infested food speaks against the possibility of dipterous larvae surviving a long time or multiplying in the human intestine. The mild intestinal symptoms that were observed cleared up promptly after evacuation of the larvae.

The patient reported the appearance of worms in the stool and thought them to be pin worms. With the aid of the microscope, the physician should be able to recognize them as maggots by their chitinous hairs. The exact classification of the species is a matter for the trained entomologist. No drastic therapeutic measures seem to be needed to rid the intestines of the larvae; if an infestation of the nose and throat can be excluded as the source of the intestinal myiasis, a spontaneous evacuation of the larvae can be expected within 48 hours.

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5. Austen, E. E.: British Flies Which Cause Myiasis in Man, London, Darling & Son, 1912.
6. Alessandri, G.: Studii ed esperienze sulle larve della Piophila Casei, Arch. de parasitol. 13: 337, 1910.
7. Herys, W. B., and Gilbert, Q. O.: An Obstinate Case of Intestinal Myiasis, Ann. Int. Med. 6: 941, 1933, cited by Kenney, M.: Experimental Myiasis in Man, Proc. Soc. Exper. Biol. & Med. 60: 235, 1945.
8. Kenney, M.: Experimental Intestinal Myiasis in Man, Proc. Soc. Exper. Biol. & Med. 60: 235, 1945.

ALLERGIC CONTACT DERMATITIS DUE TO PORK CORTICOTROPIN

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At the First Clinical ACTH Conference, attention was drawn for the first time to allergic phenomena produced by the administration of corticotropin (ACTH). Traeger[1] reported to the conference on allergic reactions in 4 of 19 patients treated with this drug. At the same meeting Markson[2] and Stillman and Bayles[3] reported one case each of sensitivity to the administration of this animal extract. At the Second Clinical ACTH Conference, Brown and Hollander[4] reported a hypersensitivity reaction in 7 of 208 patients treated, which appeared to be due to the administration of corticotropin. In four of these seven patients the reactions were of serious proportions, necessitating withdrawal of corticotropin therapy. Intradermal testing with 0.1 cc. of a 1:10,000 dilution of pork corticotropin, in four patients with allergic symptoms, was positive. When these persons were treated with beef corticotropin, there were no allergic manifestations, and they had negative reactions to intradermal tests with beef corticotropin. One of these patients subsequently had mild urticaria, and reacted with a weak positive intradermal test to beef corticotropin.

Stevenson[5] found sensitivity reactions in 6 of 113 patients treated with pork corticotropin. When skin tests were performed, reactions were positive to corticotropin and negative to pork and beef muscle extract. Hill[6] noted

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1. Traeger, C. H., in discussion on Clark, W. S.; Ropes, M. W., and Bauer, W.: Changes Produced by the Administration of ACTH and Cortisone in Rheumatoid Arthritis, in Proceedings of the First Clinical ACTH Conference-1949, Philadelphia, The Blakiston Company, 1950, pp. 356-358.
2. Markson, D., in discussion on Clark, W. S.; Ropes, M. W., and Bauer, W.: Changes Produced by the Administration of ACTH and Cortisone in Rheumatoid Arthritis, in Proceedings of the First Clinical ACTH Conference-1949, Philadelphia, The Blakiston Company, 1950, p. 355.
3. Stillman, J. S., and Bayles, T. B.: The Effect of ACTH on Juvenile Rheumatoid Arthritis or Still's Disease, in Proceedings of the First Clinical ACTH Conference-1949, Philadelphia, The Blakiston Company, 1950, pp. 393-404.
4. Brown, E. M., Jr., and Hollander, J. L.: Allergy to ACTH and the Use of Beef ACTH, Proceedings of the Second Clinical ACTH Conference. Vol. II: Therapeutics, Philadelphia, The Blakiston Company, 1951, pp. 391-394.
5. Stevenson, C. R., in discussion on Brown, E. M., Jr., and Hollander, J. L.: Allergy to ACTH and the Use of Beef ACTH, Proceedings of the Second Clinical ACTH Conference. Vol. II: Therapeutics, Philadelphia, The Blakiston Company, 1951, pp. 394-395.
6. Hill, D. F., in discussion on Brown, E. M., Jr., and Hollander, J. L.: Allergy to ACTH and the Use of Beef ACTH, Proceedings of the Second Clinical ACTH Conference. Vol. II: Therapeutics, Philadelphia, The Blakiston Company, 1951, p. 396.

that urticaria developed in one of his patients treated with beef corticotropin. Sauer [7] reported a case in which allergic manifestations were caused by pork corticotropin. Intradermal and passive transfer tests were the same as in three control patients. Feinberg [8] described a female patient in whom urticaria developed with the very first injection of pork corticotropin, and whose eruption became so severe that the drug was discontinued on the 10th injection. About a year later she had an alarming allergic reaction within five minutes after one injection of 25 mg. of beef corticotropin. Intradermal tests with beef, pork, and sheep corticotropin were positive, even in dilutions of 1:10,000,000. Furthermore, other pituitary preparations, such as anterior pituitary, posterior pituitary (pituitrin®), vasopressin injection (pitressin®), and oxytocin injection (pitocin®) also gave positive skin reactions in high dilutions. Muscle extracts of pork, beef, and sheep in 1:1,000 dilution failed to give any reaction.

These investigators noted the following allergic reactions to the injection of corticotropin: urticaria at the site of injection, generalized urticaria, pruritus, angioneurotic edema, fever, dyspnea, substernal pain, syncope, vertigo, nausea, vomiting, malaise, rapid fall of blood pressure, tachycardia, shock, and prostration. Most of the reactions were urticarial and were controllable with the administration of antihistamines. Some reactions were severer, however, and necessitated withdrawal of the drug.

REPORT OF CASE

A 48-year-old white nurse had had pruritus and dermatitis of her eyelids for a month when she was first seen, early in December, 1950. She had been treated a year before at the dermatology clinic for a basal cell epithelioma on the right cheek. On one occasion she had received an injection of penicillin, which resulted in a severe urticarial eruption. She had had rheumatic fever and pyelitis on several occasions, and previous operative procedures had consisted of an appendectomy, a tonsillectomy, a cholecystectomy, and a right radical mastoidectomy. When the patient was examined for the pruritic dermatitis of the eyelids, erythema and scaling of both upper eyelids were noted, and a diagnosis of contact dermatitis was made. The eruption had started about two weeks after the patient had used an eyebrow pencil to color some greying eyelashes. She also had used fingernail polish, deodorants, perfumes, and toilet waters. As a general duty nurse, she handled many drugs, including penicillin and streptomycin.

The patient was told not to use cosmetics; she was advised to avoid handling antibiotics; and she was told to apply boric acid compresses to her eyelids. Despite these procedures, there was no improvement in her condition until she had had a week's vacation in January, 1951. At the end of the week, the pruritus and the dermatitis had completely cleared, but they recurred two days after the patient's return to work. The history of a previous sensitivity to penicillin, plus the fact that she had just returned to work, suggested that penicillin was responsible for her present eruption. A series of patch tests gave negative results to penicillin, streptomycin, fingernail polish, and eyebrow pencil. Boric acid ointment, cold cream, aluminum acetate (Burow's solution), in 1:32 dilution, compresses, starch compresses, and tripelennamine (pyribenzamine®) hydrochloride cream were tried without benefit. Finally, because of the extreme pruritus, small doses of superficial roentgen-ray therapy were administered. Meanwhile, pruritic, erythematous, scaly plaques appeared on both external auricles.

On March 28, 1951, the patient mentioned that about two weeks prior to the onset of the eruption, she had begun to handle corticotropin in administering the drug to patients, and had handled it frequently since. Patch testing with corticotropin (20 mg. per cubic centimeter) gave a 3+ reaction on two occasions, whereas the diluent control gave negative responses. The same tests were performed on five volunteers, with negative results both to the corticotropin solution and to the diluent.

After the patient had avoided handling corticotropin for a month, the dermatitis completely disappeared. During this time, the patient again handled penicillin and other drugs and gradually resumed the use of cosmetics, without any recurrence of the skin eruption. At the end of a month, she was instructed to again handle corticotropin. Within two days there was a recurrence of eyelid dermatitis, and a pruritic, erythematous, scaly dermatitis also developed on the dorsal surfaces of both index fingers. Avoidance of contact with corticotropin again resulted in the disappearance of the eruption within a week. Patch tests were later performed with beef corticotropin [9] (25 mg. per cubic centimeter), with negative results on two occasions. It is interesting to note that since her cholecystectomy, the patient has eaten various pork products without any allergic or untoward manifestations.

SUMMARY AND CONCLUSIONS

At the First Clinical ACTH Conference in October, 1949, it was made evident that allergic reactions of varying degree were being encountered during the administration of the usual pork corticotropin. Just as with the antihistaminic drugs, it was paradoxical that a product so potent in controlling the manifestations of allergy should itself at times be a sensitizing agent.

Later, investigators reported that some persons manifested allergic reactions to pork corticotropin, others to beef corticotropin, and still others to both. Generally, intradermal testing appeared to parallel clinical sensitivity to these hormones. Intradermal testing with pork and beef muscle extracts, however, was negative. Brown and Hollander's [4] cases were apparently instances of species sensitivity, whereas Feinberg's [8] case was one of nonspecies specific corticotropin sensitivity or possibly organ (pituitary) specificity.

Whenever an allergic reaction to the administration of the usual pork corticotropin is encountered and is not controllable with antihistamines, Brown and Hollander [4] have suggested that one should substitute beef corticotropin or cortisone, or possibly attempt hyposensitization to pork corticotropin.

A case of contact dermatitis due to pork corticotropin in a nurse who showed allergic symptoms after handling the hormone is reported. Because this type of reaction had not been reported, other possible allergens, both cosmetic and occupational were considered. The elimination of these substances and the results of patch tests failed to show them to be the cause of the allergy. After corticotropin was mentioned by the patient as a possible cause, confirmation was obtained by elimination and usage tests as well as by patch tests. The fact that patch tests to beef corticotropin were negative but that those to pork corticotropin were positive is also evidence that the patient's sensitivity is not one of organ specificity but may be one of species specificity.

Other instances of corticotropin contact sensitivity will probably be encountered. Corticotropin must therefore be considered among the occupational contact allergens of nurses, nurses' aides, physicians, and workers in pharmaceutical houses manufacturing the hormone.

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[7] Sauer, B. C., in discussion on Brown, E. M., Jr., and Hollander, J. L.: Allergy to ACTH and the Use of Beef ACTH, Proceedings of the Second Clinical ACTH Conference. Vol. II: Therapeutics, Philadelphia, The Blakiston Company, 1951, pp. 396-399.

[8] Feinberg, S., in discussion on Brown, E. M., Jr., and Hollander, J. L.: Allergy to ACTH and the Use of Beef ACTH, Proceedings of the Second Clinical ACTH Conference. Vol. II: Therapeutics, The Blakiston Company, 1951, pp. 399-400.

[9] Supplied by Armour & Co., Chicago, Ill.

LOCAL EFFECT OF COMPOUND F ON REACTIONS TO MOSQUITO BITES

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Studies on the local effect of the oxysteroids have been under way in the department of dermatology and syphilology for some time. Previous studies [1] with local application and local injection of cortisone acetate and a water soluble ester of cortisone had produced no constant positive results in a large series of clinical cases nor did the detailed animal experiments of Nilzen.[2] This is contrary, of course, to the brilliant results obtained locally in diseases of the eye. Preliminary studies,[3] however, with compound F have already revealed significant evidences of a local effect. Gibson [4] has indicated that compound F has more local activity than cortisone. The following case is reported in order to show the definite and prolonged inhibitory local effect of compound F on severe reactions to mosquito bites.

REPORT OF CASE

The patient was a 46-year-old physician with a history of reaction to bites of various mosquitoes and other arthropods. It had been found in previous studies [5] that reactions to mosquito bites could be standardized by having mosquitoes of approximately the same age groups bite simultaneously on the skin under the same environmental conditions and allowing them to feed as long as they wished. The details of the early and late bite reactions have been reported for our studies by Rockwell and Johnson.[6] Our previous studies with the local use of compound E and compound F had suggested that such factors as the concentration of steroid and the activity of the suspending vehicle must also be considered. In the early experiments the steroids were used in the same suspending vehicle: a benzyl alcohol, polysorbate 80 (polyoxyethylene [20] sorbitan mono oleate) mixture. In recent experiments, however, a benzyl alcohol and saline vehicle was preferred. The steroids included cortisone acetate (11-dehydro-17-hydroxycorticosterone-21-acetate), compound F (17-hydroxycorticosterone-21-acetate), and cholesterol. These were injected intradermally in a volume of 0.2 cc. each of cortisone acetate (in concentrations of 25 mg. per cubic centimeter and of approximately 0.25 mg. per cubic centimeter), compound F (in a concentration of 25 mg. per cubic centimeter), and cholesterol (in a concentration of 25 mg. per cubic centimeter). In one experiment, polyvinylpyrrolidone, 0.2 cc. of a 3.5% solution, was also injected intradermally. (The local tissue reaction to the local deposition of these steroids and the study of their crystals in the skin will be reported later.) After the intradermal injections, the mosquitoes were allowed to bite directly over these areas, and the early and late reactions were measured and recorded by detailed colored photographs. The mosquitoes used were Aedes vexans, A. aegypti, and Anopheles quadrimaculatus. The severest reactions were obtained from A. quadrimaculatus. In this series of experiments, the immediate reaction sites varied in diameter from 4 to 10 cm. and the late reaction sites from 0.5 to 1.5 cm. These areas were often eczematoid. The mosquitoes were examined for crystals of the steroids after feeding, but with our technique none could be found.

In the first series of experiments with A. aegypti, the extents of the control site and the cortisone site were the same. The average immediate reaction site had a diameter of 15 mm., the polyvinylpyrrolidone site was 20 mm., and the compound F area revealed a tiny petechial hemorrhage just to the side of the yellowish appearing mass in the skin. The late reaction sites of the control and cortisone areas were 10 mm., of polyvinylpyrrolidone 15 mm., and of compound F 3 mm. in diameter. In the second series of experiments, A. aegypti and A. vexans were used as controls on normal skin, while A. aegypti was used over the cortisone and compound F areas injected 10 days previously. The immediate reactions were 10 mm. in each control area, 10 mm. over cortisone, and persistent tiny petechial hemorrhage in the compound F area. The late reaction site in the control and cortisone areas varied from 8 to 10 mm.; the petechial spot in the compound F area remained unchanged and persisted for four days. In the third experiment, A. quadrimaculatus was used, and the insect was allowed to bite on a control area and also just outside of the compound F site. This mosquito bite came three weeks after the injection of compound F. The control reaction area was 4 cm. in diameter, and the area of reaction just outside compound F was 2 cm. The immediate and late reactions produced an arciform swelling 5 mm. distant from, but not involving, the compound F area. In the fourth experiment, five weeks after the injection of compound F, a bite from A. quadrimaculatus produced an immediate reaction of 10 cm. and a late papulovesicular lesion of 1 cm. in the control area. There was no detectable reaction in the area of compound F, although the mosquito was observed to feed adequately from this site. The yellowish cast of the compound F area was still visible. In the fifth experiment, A. quadrimaculatus was allowed to bite over areas injected with cholesterol and cortisone. There was no significant change in the severe immediate (4.5 cm.) and late reactions (15 mm.) between the control cortisone and cholesterol sites. In the sixth experiment, three months after the local injection of compound F, which was visible as a faint whitish area in the skin, A. quadrimaculatus was allowed to bite over a control area and the compound F area. The immediate reaction site was the same in each (2.5 cm.); the late reaction site was approximately the same (5 mm.), but with a definite whitish center in the compound F area. In the seventh experiment, one month later, A. aegypti bit over the compound F area, a control area, and the cortisone area. In the compound F area the immediate reaction site was 3 mm., in the control and cortisone area, 10 mm. The late reaction sites in each area were approximately the same as the immediate reaction sites. Therefore, there was still some inhibitory response to a mild inflammatory reaction four months after the local injection of compound F. The compound F, cortisone, and cholesterol areas were removed some weeks later for detailed histopathological studies. In order to determine whether this local inhibitory effect of compound F on mosquito bites is constant, additional experiments will be done in other persons sensitive to bites of arthropods.

SUMMARY

In repeated experiments in a person sensitive to the bites of mosquitoes, it was shown that compound F injected into the skin had a definite inhibiting effect on both the immediate and late reactions to mosquitoes biting over the area where the injection was made. The local inhibitory effect persisted for at least four months following local injection of compound F. Steroid controls included cortisone acetate and cholesterol.

The cortisone acetate and compound F were furnished by Dr. Augustus Gibson, Merck and Co.

Director of the Department of Dermatology and Syphilology of the College of Medicine of the University of Cincinnati.

This investigation was supported by a research grant from the Division of Research Grants and Fellowships of the National Institutes of Health, United States Public Health Service.

The Aedes aegypti mosquitoes were obtained through W. V. King, Orlando Station, Agricultural Research Administration, Bureau of Entomology and Plant Quarantine, United States Department of Agriculture, who also identified the A. vexans mosquitoes. The Anopheles quadrimaculatus mosquitoes were obtained from Dr. Leon Schmidt, Malaria Research, Christ Hospital Research Division, Cincinnati. Jeanne Baskett, Research Associate in Dermatology, assisted in the feeding experiments.

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PREGNANCY FOLLOWING BLALOCK OPERATION FOR TETRALOGY OF FALLOT

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With the more widespread use and the increasing success of the surgical attacks on congenital cardiac anomalies, it would appear that the problem of management of pregnancy in patients having been so treated would occasionally confront the obstetrician. Correction of pulmonic stenosis in the tetralogy of Fallot by means of the Blalock procedure, the Smith-Potts operation, ablation of patent ductus arteriosus, resection of aortic coarctation, and the newer procedures of valvulotomy all will tend to increase the number of women who may advisedly or inadvisedly seek successful outcome for a subsequent pregnancy. Lund,[1] in reporting on pregnancy with maternal congenital cardiac disease in 1948, correctly predicted that such problems would arise in the near future. He expressed apprehension concerning those patients having surgery for the tetralogy of Fallot and urged that they be considered as serious cardiac risks, with pregnancy being undertaken only with extreme caution under constant observation.

A review of the literature has failed to reveal any previous report of the course of pregnancy following the Blalock operation. This procedure consists of anastomosing the pulmonary artery to the subclavian artery, thereby in effect producing an artificial ductus arteriosus and reducing the admixture of unoxygenated blood in patients with this congenital condition. The improvement in the degree of cyanosis and physical capacity of patients with tetralogy so treated is pronounced. Taussig[2] has indicated that she has knowledge of patients successfully undergoing pregnancies following this operation but gives no details, and Longmire [3] has similarly communicated successful outcomes. In the absence of previously recorded cases, it appears pertinent to report the following case, in which parturition was successfully accomplished after surgery for maternal congenital cardiac disease. There is added interest because of the previous existence of proved subacute bacterial endocarditis with apparent recovery after antibiotic therapy prior to pregnancy.

REPORT OF A CASE

The patient was an 18-year-old Mexican primigravida who was admitted to The California Hospital Maternity Clinic on Feb. 12, 1951. She gave a history of congenital heart disease with cyanosis since birth. Extensive study in 1949 had resulted in a diagnosis of tetralogy of Fallot, with a right-sided arch. On Dec. 27, 1949, a Blalock operation had been performed, accomplishing an anastomosis between the left subclavian artery and the side of the left pulmonary artery.[4] The operation had proceeded uneventfully, and there was an immediate improvement noted in the degree of cyanosis following surgery. The immediate postoperative course was rather uneventful. Postoperative temperature reached 101 F on the first and second days. This was associated with slight atelectasis of the base of the right lung. The temperature subsided as the atelectasis cleared and remained normal after the sixth postoperative day. Sutures were removed on the seventh postoperative day, and the patient was fully ambulant in the succeeding days.

Arrangements were being made for discharging the patient when suddenly, on Jan. 16, 1950, she experienced a sharp rise in temperature, to 102 F, associated with headache, chills, malaise, and sore throat. Examination revealed nothing remarkable except for a sore throat and tenderness in the operative incision. A blood culture, blood cell count, and chest x-ray were made. The chest x-ray disclosed no abnormalities, and the blood cell count was within normal limits.

Massive penicillin therapy was started; despite this, the temperature did not subside; the following evening it reached 103 F. Subsequently edema and erythema of the face, neck, and shoulders was noted, and penicillin sensitivity was suspected. Treatment with the drug was discontinued. The temperature dropped sharply to 98 F on Jan. 19. Blood culture was subsequently reported as containing Staphylococcus albus. The patient remained well thereafter, subjectively and objectively, and again was about to leave the hospital when, on Jan. 22, she experienced another sharp rise in temperature to 102 F. Examination at this time revealed erythema of the neck, face, and shoulders and a strawberry-like tongue. The spleen was palpated by some examiners, and petechiae were noted in the nail beds of the fingers but not the toes. A blood culture was taken and again revealed Staph. albus.

Medical consultants, after reviewing the case in detail, felt that the patient had subacute bacterial endocarditis and should be treated accordingly. Penicillin therapy was again undertaken, with gradually increasing doses, despite the suspected sensitivity to the drug. In addition, aureomycin was given, and the temperature gradually subsided, reaching normal on Jan. 25. On Feb. 4 resistance studies revealed that the Staph. albus recovered was resistant to penicillin but sensitive to streptomycin, aureomycin, and sulfadiazine. Penicillin therapy was then discontinued, and sulfadiazine was administered.

From Jan. 25 the patient remained asymptomatic. On Feb. 10 sulfadiazine therapy was discontinued, and on Feb. 20 aureomycin thereapy was discontinued. Numerous blood cultures taken from Feb. 9 to March 1 showed no growth. The patient was discharged, apparently well, on March 1.

On admission to the Maternity Clinic on Feb. 12, 1951, it was found that the patient's last normal menstrual period had been on Oct. 10, 1950. She stated that she had been advised against pregnancy, but, because of her desire for children, she had waited until the present time before presenting herself for prenatal care. Symptomatically she complained of shortness of breath on moderate exertion (after walking three blocks) and also noticed nocturnal dyspnea. However, she indicated that she was less dyspneic at the present time than preceding surgery (see table).

Past history revealed the usual childhood diseases, with diphtheria at the age 16. Owing to the fact that she had been born a "blue baby," the patient's activities had always been restricted. Minimal exertion had always caused dyspnea, palpitation, shortness of breath, chest pain, dizziness, and episodes of fainting. Her skin was always bluish prior to surgery. After the Blalock procedure, in 1949, there had been decided general improvement, with minimal cyanosis and shortness of breath, less frequent bouts of dizziness, no fainting, and only moderate dyspnea after walking 8 to 10 blocks. Occasional palpitation was noted, but only since the onset of pregnancy. Menarche had occurred at the age of 14. Menses had always been irregular, occurring every two to six months, with scanty flow. After cardiac surgery, the periods had become regular, with a 28-day cycle, lasting seven days with moderate flow.

Physical examination revealed a short, well-developed girl in no acute distress. The blood pressure was 118/70 and pulse rate 80. The skin was dusky, and the nail beds showed a mild degree of cyanosis; there was moderate clubbing of the fingers. The head and neck were essentially normal; the right pupil was smaller than the left. Tonsils were moderately hypertrophic. There was a long surgical scar on the left anterolateral aspect of the chest wall. The heart appeared to be enlarged approximately

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From the Department of Obstetrics and Gynecology, The California Hospital.

[1] Lund, C. J.: Maternal Congenital Heart Disease as an Obstetric Problem, Am. J. Obst. & Gynec. 55: 244-261 (Feb.) 1948.

[2] Taussig, H. B.: Personal communication to the authors.

[3] Longmire, W. P., Jr.: Personal communication to the authors.

[4] Dr. William P. Longmire Jr. reported the surgical procedure and postoperative course.

2 cm. to the right of midsternum and to the left anterior axillary line. There was a loud to-and-fro murmur to the left of the sternum, at the fourth interspace. There were systolic murmurs at the aortic and pulmonic areas as well as apical systolic and diastolic murmurs. The lungs were clear to percussion and auscultation. The abdomen was enlarged to a size consistent with a four-month pregnancy.

Pelvic examination confirmed the above findings, with no abnormalities being noted. Clinical pelvimetry revealed measurements within normal limits. Laboratory examinations revealed hemoglobin 18 gm., red blood cell count 5,600,000, and white blood cell count 14,000, with a normal differential count. The urine was negative for albumin and sugar, with a specific gravity of 1.022. Serologic reactions were negative. The patient was Rh positive.

X-ray of the chest revealed only prominence of the mediastinum on the right side, which was thought to be due to a prominent vascular shadow. Blood culture at this time revealed no growth after seven days. Electrocardiograms revealed sinus rhythm, at the rate of 85 with a P-R interval of 0.14 seconds and Q-S intervals 0.08 seconds. These findings were considered consistent with heart strain of the extreme right. Cardiac consultation resulted in the classification of this patient as functional class 2.

During the next two weeks the patient experienced bouts of fever, sore throat, and an increase in dyspnea after walking only one-half block. However, she did not experience orthopnea. It was recommended that she be hospitalized for careful medical evaluation.

On admission to the hospital (approximately 22 weeks' gestation), the blood pressure was 130/64 and temperature 99.4 F (subsequently normal); fetal heart tones were audible. History and physical findings were essentially as given. Treatment consisted of bedrest and sedation.

The following tests and results were obtained: vital capacity 3 liters, or 100%; venous pressure 6.8 cm.; circulation time, arm to tongue, 7.4 seconds (calcium gluconate); pulmonary time 4.7 seconds (ether 0.185 cc.); corrected sedimentation rate 22 mm. per hour; hemoglobin 15.8 gm.; red blood cell count 4,690,000; and white blood cell count 13,000, with a normal differential count. The urine was essentially normal. A 7 ft. (213 cm.) x-ray of the chest revealed no significant change as compared with the previous examination. Three consecutive blood cultures were reported as negative.

The patient was released after four days of hospitalization, at which time the dyspnea was less. She continued her routine vitamin and mineral therapy, with the empirical addition of iron. During the subsequent antepartum course, the patient had no other complaints or further bouts of fever. At the 38th week a rupture of membranes was suspected, and she was given penicillin. Two weeks later this treatment was stopped. No undue reaction was noted with the use of penicillin. X-ray pelvimetry at term confirmed the normal pelvic measurements.

Review of the case in all its aspects led to the decision that, in the absence of purely obstetric complications, the patient should be delivered vaginally on complete dilatation of the cervix with the benefit of low forceps extraction and episiotomy. Continuous caudal anesthesia was recommended, in order that the voluntary efforts of labor, particularly during the second stage, be minimized.

The onset of labor occurred spontaneously on July 25, 1951, and the patient was admitted to the hospital at 6:00 p. m. with the cervix dilated 3 cm. Continuous caudal anesthesia with 1.5% piperocaine hydrochloride was instituted at 9:00 p. m. by the staff anesthetists. At this time the patient's blood pressure was 140/72, pulse rate 82, and respirations 16 per minute. Blood pressure, pulse rate and respiratory readings were taken every five minutes during the entire labor, and no more than an 8 mm. Hg variation of blood pressure was noted throughout this time. The pulse rate varied from 82 to 88 per minute, and respirations remained at 16 to 18 per minute. The patient was subjectively and objectively comfortable in a low Fowler position. At complete dilatation and +2 station, delivery was effected by Kielland forceps rotation and extraction from a right occiput posterior position after a left mediolateral episiotomy. An apparently normal 2,282 gm. female infant was delivered at 12:33 a. m., July 26; the infant cried within 15 seconds after delivery of the head. The third stage proceeded uneventfully, the placenta being delivered by simple expression, after which ergonovine maleate was given intravenously. The total duration of labor was approximately nine hours. Penicillin, 600,000 units, was given intramuscularly with the onset of labor, and 300,000 units was given daily through the 14th postpartum day. After delivery the patient was observed carefully for any signs of cardiac failure and placed on a regimen of complete bed rest for four days and then allowed bathroom privileges on the fifth postpartum day. She was discharged on the eighth postpartum day.

The patient was seen at the fourth postpartum week for her first follow-up examination. She felt well and was able to accomplish her former routine of light domestic activities with minimal dyspnea (see table). The uterus was well involuted; the cardiac murmurs were essentially the same as in early pregnancy, except for diminished intensity. The blood pressure was 132/72, pulse rate 80, and respirations 18. No peripheral edema was noted, and the liver was not palpable. The patient was advised to return at regular intervals during the following months for cardiac evaluation.

COMMENT

Congenital cardiac disease as a maternal complication constitutes but a small portion of the total cardiac complications of pregnancy. In most series, rheumatic heart disease accounts for 90% to 95% of all cases of this type of maternal involvement. However, the congenital derangements in general carry a poorer prognosis for the mother and have, as a consequence, led to a relatively higher incidence of therapeutic abortion. It is hoped that the success of various surgical approaches to the complete or partial correction of many of these cardiac abnormalities may lead to a revision of current practices in this regard.

Changes Noted in Patient During Pregnancy After Blalock Operation for Tetralogy of Fallot

Time	Dyspnea	Cyanosis	Clubbing of Fingers
Before operation	After walking ½ block	Marked	Marked
After operation	After walking 8-10 blocks	Very slight	Regression
Fourth month gestation	After walking 3 blocks	Slight	Moderate
Fifth month gestation *	After walking ½ block	Moderate	Moderate
Sixth to ninth month gestation	After walking 3 blocks	Moderate	Moderate
Fourth week postpartum	After walking 8-10 blocks	Slight	Moderate

* Prior to hospitalization.

The patient described herein was considered for therapeutic abortion when first seen. However, careful evaluation of her then current status resulted in a decision against this procedure; it was felt that the improvement resulting from the Blalock operation justified the continuation of her pregnancy. Except for one episode suggestive of incipient cardiac failure in the fifth gestational month, for which the patient was hospitalized, her course during pregnancy was essentially uneventful. The prevention of recurrence of bacterial endocarditis was an ever present concern, for which antibiotics were utilized before and after delivery with apparent success. The immediate postpartum period, always a critical phase in the management of congenital cardiac parturients, especially those with interventricular septal defects,[1] was without incident.

It would appear that the general improvement in physical and functional capacity afforded many patients by surgical treatment of their congenital cardiac lesions may offer a more favorable prognosis to those in this category contemplating pregnancy. Further studies are, of course, necessary before specific conclusions can be drawn.

SUMMARY

A case of pregnancy following the Blalock operation for tetralogy of Fallot is reported. After cardiac surgery, a patient with a congenital cardiac condition who previously would have been considered a grave obstetric risk was successfully carried through pregnancy. With carefully supervised prenatal care and a planned mode of conduct of labor with caudal anesthesia, vaginal delivery was effected with a moderate calculated maternal and fetal risk. No conclusions can be drawn from one case, but this report suggests that pregnancy may not be permanently contraindicated in certain types of poor risk patients with cardiac lesions amenable to surgery.

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EARLY AMBULATION IN PREVENTION OF POSTOPERATIVE THROMBOEMBOLISM

SUPPLEMENTARY CLINICAL NOTE

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Leo Saraf, M.D.
Stanley Smyka, M.D.
and
Michael Sheridan, M.D., Detroit

Within the past few months, since we prepared our recent report[1] on the prevention of thromboembolic complications by means of early ambulation, we have observed two cases that we believe should be recorded in view of our previous statement that "We have not, in the 12 years during which early ambulation has been practiced, seen a single patient with fatal or nonfatal pulmonary embolism." These observations are submitted in order to complete the record and to report the whole truth regarding our experience with thromboembolic complications. The diagnosis of pulmonary embolism was made clinically in the first case, and was regarded as a possibility in the second instance, in which the findings led to questioning of this conclusion.

Case 1.—A man, 58, had a high bilateral saphenous ligation, with stripping and multiple resections for varicosities, and chronic phlebitis of the right leg, with threatened ulcer. The patient was ambulatory and was discharged from the hospital the day after the operation. Five days later he experienced a sudden pain in the left side of the chest, with subsequent symptoms of pleurisy and the expectoration of blood-streaked sputum. The illness was relatively mild, so the patient was not rehospitalized; hence, roentgenograms of the chest were not obtained. Ambulation was continued, and, with symptomatic treatment, the patient's recovery was prompt and uneventful. Ten days after the attack of pain, the patient was completely well and has remained so during the ensuing months. Although roentgenologic confirmation was lacking, it was our definite clinical impression that this patient's symptoms were caused by a pulmonary embolism from a small thrombus.

Case 2.—A married woman, 59, had a large cystocele and rectocele, for which an anterior and posterior colporrhaphy was performed. Ambulation was instituted four hours after operation, and the patient's recovery was entirely uneventful. Her condition warranted her discharge from the hospital on the fourth postoperative day, but since she was somewhat loathe to exercise sufficiently, she was not discharged until the seventh day. When the patient returned home, her husband did not follow the instructions that she continue to be ambulatory but kept her confined to bed, not even allowing her to get up for her meals, although she did exercise bathroom privileges.

Three days after the patient's return home, in the middle of the night after the 11th postoperative day, a pain developed low in the midsternal area. The onset was gradual, with increasing severity. Within eight hours after appearance of the pain, dyspnea was pronounced, and the lungs became flooded with secretions. It was another 10 hours before a physician was called, at which time the patient's condition was critical. A massive pulmonary embolism was suspected, and she was immediately readmitted to the hospital.

A thorough physical examination revealed that there was no edema of the lower extremities, and no signs of phlebitis were evident. Homan's sign could not be elicited in repeated attempts. The patient's temperature on admission was 100 F (37.8 C), the pulse rate was 84, and the heart beat was regular and of fair volume. The blood pressure was 120 systolic, 70 diastolic. The heart sounds were greatly muffled by rales from the lungs but seemed of fair quality. The first sound at the apex was considerably accentuated, probably because of the poor quality of the aortic and pulmonic sounds. The pulmonic second sound was not accentuated. The lungs were filled with moist rales, both inspiratory and expiratory, and breathing sounds were diminished. The leukocyte count was 28,600. The cardiologist who saw the patient in consultation soon after admission, made the following note: "Although the history of an acute episode of dyspnea and cyanosis occurring on the 11th postoperative day would lead one to suspect a pulmonary thrombosis or embolism, the physical examination would indicate to me one of two things: (1) acute left ventricular failure with acute pulmonary congestion or (2) myocardial infarction."

The first roentgenograms of the chest, made on the day of admission, showed some cardiac enlargement, calcification in the walls of the aorta, apparent congestion in the lung fields, and possible infarction in the right upper lobe. The roentgenologist's impression was "cardiac decompensation with possible infarction in the right upper lobe." The initial electrocardiogram showed evidence of myocardial anoxemia, although no signs of myocardial infarction were noted. On the basis of the roentgenographic and electrocardiographic findings and a subsequent examination of the patient, the cardiologist inclined toward the view that there was an infarction in the upper lobe of the right lung, in contrast to his initial impression. Subsequent roentgenograms showed diminished congestion in the lung fields. A second electrocardiogram, made two weeks after admission, showed rapid auricular fibrillation, with findings "equivocal for myocardial infarction, posterior type, or pulmonary embolism."

The midsternal pain disappeared soon after the patient's admission, but dyspnea and cyanosis continued, and two days later she began to expectorate blood. Repeated bronchial aspiration and nasal administration of oxygen afforded much relief. Later, digitalis was administered. Improvement was relatively slow, but ambulation was reinstated gradually after the sixth day, when symptoms of air hunger and shock had subsided. Anticoagulants were not administered. Effusion developed in the right pleural cavity, and 28 days after admission, 600 cc. of a straw-colored fluid was aspirated.

Thirty-three days after the first attack, a second episode of midsternal pain occurred, and again dyspnea was pronounced, with expectoration of blood. This time, effusion developed in the left pleural cavity, and 15 days later, aspiration of 500 cc. of straw-colored fluid was carried out. The patient improved rapidly after the second episode, and ambulation was reinstated gradually within a few days. The patient remained in the hospital

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[1] Leithauser, D. J.; Saraf, L.; Smyka, S., and Sheridan, M.: Prevention of Embolic Complications from Venous Thrombosis After Surgery; Standardized Regimen of Early Ambulation, J. A. M. A. **147**: 300-303 (Sept. 22) 1951.

25 days after the second attack of pain. At the time of her dismissal, moist rales were still present in both lung fields. The prognosis remained guarded.

Six days after her return to her home, the patient suffered another acute attack of pain in the chest and died immediately. Permission for an autopsy could not be obtained, so pathological confirmation of the diagnosis is lacking. While the patient was in the hospital, and especially after the second attack, we were inclined to the view that the symptoms were caused by a massive pulmonary embolism, especially since the pulmonary signs were so pronounced, with the effusion predominantly on the right side in the first instance, and on the left in the second. Nevertheless, the symptoms and course were in many respects atypical for postsurgical pulmonary embolism.

COMMENT

The reporting of these two cases in which there was presumptive evidence of pulmonary embolism furnishes a qualifying footnote to the record of our experience with early ambulation, which heretofore had included no single instance in which there were any clinical signs pointing to this complication. It is unfortunate that in neither case are we able to furnish conclusive or pathological proof of the presence of this complication; however, in view of our previous report on the complete absence of pulmonary embolism in our series of cases, we add these cases to the record for the sake of scientific accuracy.

We believe that these two cases do not vitiate or contradict the conclusions we have stated regarding the value of early ambulation in the prevention of thromboembolic complications, since the first case was extremely mild, and in the second instance, the diagnosis was doubtful. If death was due to massive pulmonary embolic processes in the latter case, it might possibly have been avoided if the patient had not been confined to bed at home, after leaving the hospital. Hence, we repeat that "vigorous flexion and extension of the toes, ankles and knees (in-bed exercises), and frequent walking in as brisk a manner as possible will quicken the circulation in the veins and keep the sticky sludge moving. Thus, any loosely attached minute thrombus will be dislodged before the formation of a clot of sufficient size to cause fatal pulmonary embolism." [1]

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Antibiotics and Anticoagulants.—Recently we have been impressed by the observation that certain patients who appear well stabilized on a fixed dose of a coumarin derivative may show a marked prolongation of the prothrombin time shortly after starting to receive a gut-sterilizing antibiotic. The incidence of occurrence of this phenomenon appears to have increased with the widespread use of these antibiotics for all types of cases, especially those of a surgical nature. . . . The explanation, which must be considered hypothetic at this time, may be found in these facts. The production of vitamin K is largely dependent on the action of the bacterial flora of the intestinal tract. Vitamin K acts as a buffer against the coumarin compounds, holding their action in check to a certain degree. When the bacterial flora are killed off or greatly disturbed, the production of vitamin K is sharply diminished and the action of the anticoagulant drugs is unrestrained, resulting in (a) excessive action and (b) reduced dosage requirements. Pending confirmation or clarification of these observations, the gut sterilizing antibiotics should be administered with caution when the patient is receiving anticoagulant therapy which interferes with prothrombin production. —I. S. Wright, M.D.: The Pathogenesis and Treatment of Thrombosis, *Circulation*, February, 1952.

USE OF CHOLINERGIC DRUGS IN PAROXYSMAL SUPRAVENTRICULAR TACHYCARDIA

SERIOUS UNTOWARD REACTIONS AND FATALITY FROM TREATMENT WITH METHACHOLINE AND NEOSTIGMINE

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and
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The effectiveness and usefulness of methacholine chloride in terminating attacks of paroxysmal tachycardia of supraventricular origin have become well established since Starr's introductory report in 1933.[1] The distressing occurrence of varying degrees of heart block following the original injections of 100 mg. or more was largely overcome by the use of doses of 20 to 40 mg.[2] Even these smaller doses often evoked unpleasant cholinergic effects. This led to the introduction of neostigmine as a substitute for [3] or adjuvant to [4] methacholine. Both agents are capable of evoking drastic effects by their action on the autonomic nervous system. Their proper use requires a clear understanding of their pharmacodynamic activity.

Standard textbooks that deal with the treatment of acute attacks of supraventricular tachycardia almost invariably mention the use of both methacholine and neostigmine, as well as the commoner methods of therapy, such as various forms of vagal stimulation and the use of digitalis and quinidine. While attention is usually directed to the untoward side-effects and necessary precautionary measures that must be taken when either of these drugs is used, comment regarding their combined used is rare. Dameshek [4] has stated: "The drastic actions of the prostigmin-mecholyl combination are worthy of great respect. However, the careful clinician should not be deterred from using a relatively small dosage (say 10 mg.) of mecholyl after 0.5 mg. of prostigmin."

The three cases reported herein are selected from a larger experience at the New Haven Hospital because they illustrate some of the untoward effects and hazards of these drugs.

REPORT OF CASES

Case 1.—M. T., a 50-year-old white policeman, was seen in the emergency room on Jan. 27, 1944, because of an attack of paroxysmal auricular tachycardia. The diagnosis was verified by electrocardiograms. He had been subject to episodes of tachycardia for 12 years, and on one occasion congestive failure had developed during an attack. This was the third attack observed at

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[1] Starr, I., Jr.: Acetyl-Beta-Methylcholin: Its Action on Paroxysmal Tachycardia and Peripheral Vascular Disease, with Discussion of its Action in Other Conditions, Am. J. M. Sc. **186**: 330-345 (Sept.) 1933.

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[3] (*a*) Pelner, L.: Prostigmin in Paroxysmal Tachycardia: Preliminary Report, M. Rec. **153**: 209-210 (March 19) 1941. (*b*) Waldman, S., and Moskowitz, S. N.: Effect of Prostigmin on Supraventricular Tachycardias: Preliminary Report, M. Rec. **153**: 134-136 (Feb. 19) 1941.

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the New Haven Hospital and had been continuous for 17 hours. The blood pressure was 90/65 and the heart rate 190, but the patient was in no significant distress. After carotid sinus pressure proved ineffectual, the patient was given 1 mg. of neostigmine, subcutaneously, which, while causing mild sweating, did not alter the heart rate. Thirty-five minutes after the neostigmine injection he was given 15 mg. of methacholine chloride. After about five minutes the skin became deeply flushed, he perspired profusely, and marked dyspnea developed. Because of this alarming reaction, 0.3 mg. of atropine sulfate (which had previously been made ready) was immediately injected intravenously, with the hope of diminishing but not abolishing the cholinergic effect. Flushing and dyspnea promptly diminished, and within three minutes sinus rhythm was established, with a rate of 90. At this time a second intravenous injection of atropine sulfate, 0.6 mg., was given, and the cholinergic symptoms completely and promptly disappeared. The blood pressure was now 125/85, and the patient was discharged.

Comment.—On a previous occasion this patient had had congestive heart failure as a result of paroxysmal auricular tachycardia. The current attack had been in progress for many hours, with a rapid rate and hypotension. Therefore, prompt termination of the attack was deemed highly desirable and the patient was treated with neostigmine and methacholine chloride. Moreover, our interest was great in what was then a newly developing field of autonomic pharmacology. Before we administered these drugs, the necessary precaution of having atropine sulfate in a syringe ready for instant use was observed. It seems probable that its prompt use in this case prevented the progression of dangerous cholinergic manifestations.

Case 2.—A 58-year-old Polish man was brought by police ambulance to the emergency room on March 10, 1944, in a state of profound prostration. Although he spoke almost no English, he indicated that he was having pain in the abdomen and had been coughing and raising bloody sputum for several days. As far as could be ascertained there had been no vomiting, chest pain, or chills. The patient was seriously ill, exhibiting pronounced cyanosis, dyspnea, and orthopnea. The blood pressure was unobtainable. The neck veins were greatly distended, and the liver was tender and extended 4 cm. below the costal margin, but there was no dependent or pulmonary edema. An electrocardiogram revealed supraventricular tachycardia, with no apparent P waves.

It was felt that acute and severe congestive heart failure was present, either as a result of or seriously aggravated by a prolonged attack of paroxysmal tachycardia. The patient was given oxygen immediately and, when carotid sinus stimulation proved ineffective, a subcutaneous injection of 25 mg. of methacholine chloride. Neither the medication nor subsequent carotid massage, repeatedly employed, terminated the tachycardia. No outspoken cholinergic effects (flushing, lacrimation, salivation, rhinorrhea, and sweating) were observed. At the end of two hours neostigmine was given subcutaneously. When this, together with carotid sinus stimulation, proved ineffective, a second injection of methacholine chloride was employed. The dose was 30 mg., and it was given 40 minutes after the neostigmine injection. Within one minute, the patient began to salivate profusely and voided involuntarily and asthmatic breathing developed. The heart rate slowed markedly for a few seconds, and then audible heart action and respiration ceased. A tourniquet was immediately applied proximal to the injection site, and 0.8 mg. of atropine sulfate and 1 mg. of epinephrine (representing the ideal combination of pharmacologic antidotes) [5] were injected intracardially. Artificial respiration was begun, but all efforts at resuscitation failed.

Necropsy revealed a dilated and hypertrophied heart, which weighed 610 gm. The aortic valve was moderately calcified, and the coronary arteries showed arteriosclerosis without actual occlusion or thrombus. No myocardial infarction was found on careful gross and microscopic examination. The right auricular appendage contained an antemortem clot, and a small thrombus was attached to the intraventricular septum and adjacent wall of the right ventricle. The lungs were moderately congested but revealed no infarcts or emboli. The liver weighed 1,670 gm. and showed chronic passive congestion. Moderate atherosclerosis was present in the aorta and mesenteric arteries.

Comment.—Although death was not unexpected in view of the patient's grave cardiac status, the coincidence of cardiac slowing and arrest with the onset of pronounced cholinergic symptoms argues strongly that at least the time of death was attributable to the nature and mode of administration of the medications. Certainly the initial injection of 25 mg. of methacholine chloride can be exculpated, for the dose employed was moderate, and it produced no pronounced cholinergic expressions. Doses 4 to 12 times larger have been given without fatal results.[6] It is also unlikely that the injection of neostigmine two hours after the administration of methacholine chloride was responsible for death. The fleeting effects of the latter [7] probably were completely dissipated long before the neostigmine was given. Moreover, the dose of neostigmine was an average and recommended one,[8] and no pronounced cholinergic effects developed in the ensuing 40 minutes. This line of reasoning leads to the conclusion that the second dose of methacholine chloride was responsible. At that time the second injection was believed to be proper because 40 minutes had elapsed after an apparently ineffective dose of neostigmine. A dose of 30 mg. was employed because the previous injection of 25 mg. had provoked no significant reactions. Moreover, the dose and timing were thought to provide an adequate factor of safety, as judged from the available literature [4] on the combined use of these agents. In the light of our experience in this case, we are of the opinion that the use of methacholine within several hours after the administration of neostigmine is dangerous, and such combined treatment generally should be avoided. Dameshek has emphasized the dangers involved when the administration of neostigmine is followed by administration of methacholine in 30 minutes or less.[4]

Case 3.—A. B., a 30-year-old white man, gave a history of 16 years of paroxysmal tachycardia, the attacks occurring about once monthly. Electrocardiograms during several attacks showed abnormally wide and slurred QRS complexes, with a rate of 160 per minute and without clearly discernible auricular deflections; between attacks, intraventricular conduction was normal. Unlike paroxysmal tachycardia of ventricular origin, these attacks had repeatedly responded promptly to the subcutaneous injection of neostigmine. For this reason, and because there was no evidence of cardiovascular disease, the tachycardia was regarded as supraventricular in origin, with associated functional intraventricular block. On June 6, 1950, the patient came to the emergency room for treatment of an attack that had been continuous for a week. Ten minutes after a subcutaneous injection of methacholine chloride the tachycardia stopped abruptly. Six weeks later the patient returned during an attack that had been going on for five days. Substernal pain and dyspnea were beginning to develop. The heart rate was 158 per minute, and electrocardiograms showed the patient's usual type of tachycardia. However, injection of 1 mg. of neostigmine and subsequent carotid sinus massage were ineffective over a period of 30 minutes, and at that time 25 mg. of methacholine chloride was injected subcutaneously. Within a few minutes the patient began to perspire profusely, diarrhea developed, and he appeared generally distressed. Previously prepared atropine sulfate, 0.4 mg., was given intravenously to ameliorate the cholinergic reactions. Prompt control of symptoms resulted, and the heart was then noted to have slowed to 122 beats per minute, but the electrocardiographic pattern of the tachycardia was not otherwise altered. It was decided to abandon further use of cholinergic drugs, and the patient was treated with quinidine sulfate. He received a total of 1 gm. in fractional doses over a five-hour period, at the end of which time sinus rhythm with normal intraventricular conduction returned. He was discharged on maintenance doses of quinidine.

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[7] Footnotes 1 and 2.

[8] (*a*) Waldman and Moskowitz.[8b] (*b*) McCord, M. C., and Taguchi, J. T.: Study of Effect of Procaine Amide Hydrochloride in Supraventricular Arrhythmias, Circulation **4:** 387-393 (Sept.) 1951.

Comment.—Neostigmine was chosen for treatment in this case because it was desired to employ rapidly effective therapy. The paroxysm of tachycardia had been an unusually long one, and symptoms of cardiac distress were present. Moreover, the previous use of neostigmine in this case had proved effective promptly. When, on the second occasion, neostigmine and carotid sinus stimulation did not terminate the attack in the course of 30 minutes, methacholine chloride was given in a dose that the patient had received six weeks previously as the sole medication without untoward effects. However, full appreciation of the pronounced potentiating effects of these agents when used in combination would have resulted in the use of a smaller dose of methacholine chloride than 25 mg. Fortunately, the precaution of having atropine sulfate at hand in a syringe permitted prompt modification of the impending reaction.

COMMENT

Although both methacholine chloride and neostigmine may be rapidly effective and theoretically ideal in the treatment of attacks of paroxysmal tachycardia of supraventricular origin, and true pharmacologic antidotes are available in atropine and sympathomimetic drugs to ameliorate or promptly extinguish actions of these cholinergic agents, proper administration requires a clear understanding of their pharmacologic properties and experience in their use.

The pharmacologic properties of methacholine chloride resemble those of acetylcholine, except for the less pronounced nicotinic effect on autonomic ganglions. The usual therapeutic dose of 25 mg. produces a fall in blood pressure, tachycardia, and a slowing of auriculoventricular conduction. Intravenously administered atropine results in prompt disappearance of these effects. Neostigmine exerts its pharmacologic action by virtue of its ability to inhibit cholinesterase in body fluids and tissues. When given prior to a small dose of methacholine chloride, severe sinus bradycardia may result; when followed by the ordinary dose of methacholine chloride, severe heart block results, which is sometimes complete.

In our opinion neither agent should be used in the average case except after less dangerous methods have been properly employed without success. These include reflex vagal stimulation by such means as carotid sinus, ocular, or abdominal pressure; Valsalva or Müller procedures; and induced gagging and vomiting. These failing, the use of digitalis or quinidine can usually be depended on to terminate an attack. Sedatives should be used as necessary. Purified digitalis preparations suitable for intravenous use permit rapid treatment in situations in which restoration of a normal mechanism is a matter of great urgency. An increasing experience with the use of procaine amide is being reported and holds some promise.[8h] Only in such situations in which the patient's condition is so grave that results must be achieved within a matter of minutes, rather than hours, do we feel that the use of methacholine chloride is justified.

When the decision is reached to employ methacholine chloride, it is recommended that the following arrangements be provided: an intravenous drip should be set up in the opposite arm and provision made for the attachment, through a three-way stopcock, of syringes previously prepared with 2 mg. of atropine sulfate and with epinephrine or amphetamine sulfate or both.[5]

Should pronounced cholinergic symptoms or cardiac arrest result, with collapse of the veins under the latter circumstances, no difficulty will be experienced in getting the atropine placed intravenously without delay, and the reservoir of sodium chloride solution may be raised to hurry the atropine along to the heart. At the same time a *tourniquet should be placed proximal to the site of injection of methacholine chloride to block further absorption. If signs of recovery are not seen within 15 to 20* seconds, atropine sulfate and epinephrine should be injected directly into the heart. Obviously, such therapeutic manipulations are not simple. Their relative complexity, the decidedly unpleasant reactions to effective doses of methacholine chloride, and the hazard of treatment with this drug in cases of coronary artery disease and of asthma should influence one to resort to other measures and devices for the termination of paroxysmal supraventricular tachycardia, unless, as is seldom the case, the patient's condition is grave. Under such hazardous circumstances the conjoint use of neostigmine and methacholine chloride would seem particularly dangerous and contraindicated, and cholinergic therapy should be limited to the use of methacholine chloride in subcutaneous doses starting at 10 or 15 mg. and increasing at about 20 minute intervals as indicated by the patient's general reaction to the previous ineffective dose. When neostigmine has been administered, an interval of at least four hours should elapse before methacholine chloride is injected, or, when delay is not possible, such injection should be limited to 2 or 3 mg., in an adult, to permit estimation of the degree of potentiation that may still be present from the neostigmine.

SUMMARY AND CONCLUSIONS

The hazards of the conjoint use of neostigmine and methacholine chloride in the treatment of paroxysmal supraventricular tachycardia are discussed. Three illustrative cases are reported. Treatment was successful but not without danger in two instances. In the third, death followed a second injection of methacholine chloride given 40 minutes after a dose of neostigmine. Death was

A HAZARD OF REPEATED BLOOD TRANSFUSIONS

HEMOLYTIC REACTION DUE TO ANTIBODIES TO THE DUFFY (Fy^a) FACTOR

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The use of whole blood in the treatment of medical and surgical conditions has increased greatly during the past 10 years to the point where about 3,000,000 transfusions are given each year in this country alone.[1] This widespread use of blood transfusions has led to the recognition of a number of serious hazards associated with the procedure, the most commonly encountered and best known of these being Rh immunization, hemolytic reactions due to major blood group incompatability, and the transmission of certain diseases, notably homologous serum jaundice, malaria, syphilis, and, in some areas, brucellosis.[2] An additional hazard that is less well recognized, but one that is growing in importance because of the increasing incidence of repeated blood transfusions, is that of hemolytic reaction due to immunization by one or more of the recently discovered blood group factors, such as Kell (K),[3] Cellano (k),[4] Duffy (Fy^a),[5] Kidd (Jk^a),[6] and others.[7] It is now apparent that, in patients given repeated blood transfusions, antibodies to one or more of these antigenic factors may develop, and, further, that such antibodies are in many instances not detected by the conventional cross-matching techniques. It is the purpose of this paper to describe the occurrence of a hemolytic transfusion reaction in a patient whose serum contained antibodies to the Duffy factor, and to point out some of the modifications in cross matching techniques that may be employed as additional safeguards to prevent such accidents.

REPORT OF A CASE

A. D., a 36-year-old male physician, was admitted to the New York Hospital in March, 1951, complaining of epigastric cramps and tarry stools. Three years previously, while abroad, he had received 8 to 10 whole blood transfusions because of a bleeding duodenal ulcer. At the time of admission to the New York Hospital he was found to have group O, Rh positive blood. A subtotal gastrectomy was performed, during which 500 ml. of group O, Rh positive blood was administered while the patient was under general anesthesia. This blood had been found to be compatible by means of the conventional cross matching test of the recipient's serum and donor cells and also by means of the trypsinated cell technique routinely employed in this laboratory.[8] The patient had a generalized rigor shortly after the completion of the transfusion. The urine was dark brown to black and was strongly positive for hemoglobin during the first postoperative day and contained small amounts of hemoglobin for the next 12 hours. The patient became intensely jaundiced during the first postoperative day, and the jaundice cleared slowly during the ensuing week. The blood pressure, red blood cell count, hemoglobin, urinary output, and liver function tests remained normal, and the subsequent postoperative course was uneventful.

As soon as the signs of a hemolytic transfusion reaction were recognized, blood from the patient and the donor were rechecked, and the grouping and Rh typing were found to be as previously determined. The patient's pretransfusion serum was then tested with the donor's cells suspended in sodium chloride solution and with trypsinated donor cells, and no agglutination was observed. Also, the patient's serum failed to agglutinate the trypsinated cells used in this laboratory to detect Rh-Hr immunization.[8] The result of an indirect Coombs test,[9] however, with the use of the patient's serum and the donor's cells was strongly positive. The fact that the serum failed to agglutinate trypsinated cells containing the known Rh-Hr antigens fairly well ruled out the presence of antibodies to these factors, since this technique is a sensitive one for the detection of such antibodies.[10] Furthermore, the fact that the serum contained an antibody that did not agglutinate the donor's cells, either normal or trypsinated, but that did coat the cells strongly as demonstrated by the indirect Coombs test suggested that it might contain antibodies to the Kell or Duffy factors, since apart from the Rh antibodies these are the most common ones that are known to have clinical significance. Cells from the patient and donor were therefore tested with known antiserums to these factors; the patient's blood was found to be Kell negative and Duffy negative, and the donor's blood, Kell negative and Duffy positive. The patient's serum was then tested with a large panel of known Duffy positive and Duffy negative cells, with the use of the indirect Coombs technique, and it was found to be uniformly positive with Duffy positive cells and negative with Duffy negative cells. These tests tentatively established the antibody to be anti-Duffy, and this was later confirmed in the laboratory of Drs. Vogel and Rosenfield. The titer of the antibody in blood drawn from the patient 1, 13, and 215 days postoperatively was 1:64 on each occasion. The serum contained no additional abnormal antibodies.

COMMENT

The Duffy factor was first described in England in 1950 by Cutbush, Mollison, and Parkin,[5a] who reported a hemolytic transfusion reaction caused by antibodies to a previously undescribed blood group factor in a patient who had received repeated blood transfusions. The factor was named after the patient in whom it was discovered and was subsequently given the symbol Fy^a. In the year and a half since the first report, four other hemolytic reactions due to this factor have been recorded,[5] and at least three others have come to our attention, though they

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have not as yet been reported [11]; it seems likely that the total number of such reactions may not be inconsiderable.

The Duffy factor is present in the red cells of 65% of the white population, the remaining 35% being Duffy negative reactors. Random sampling of the Negro population in New York City by Miller, Rosenfield, and Vogel [12] and also by us revealed a pronounced difference in the incidence of the Duffy factor in this group, only about 20% being Duffy positive reactors. That the Duffy factor is antigenic is demonstrated by the observation that when persons with a negative Duffy reaction are given transfusions of Duffy positive red cells specific antibodies (anti-Fy^a) may develop in significant titer. The Duffy factor, however, is probably a relatively poor antigen, for, though hundreds of thousands of Duffy negative reactors are given Duffy positive blood each year, only a small number of cases of specific immunization have thus far been detected. Most of the instances in which Duffy antibodies have been detected have followed numerous blood transfusions, although in the case reported by Rosenfield, Vogel, and Race [5d] the patient had had no previous transfusions and in one reported by Ikin, Mourant, and Plaut [5b] a hemolytic reaction due to the Duffy antibody occurred with the third transfusion.

Antibodies to the Duffy factor when present in the serum constitute a definite hazard to the patient, for transfusion of Duffy positive cells may result in a serious hemolytic reaction. An interesting and particularly important fact about these antibodies is that all that have been described to date are of the "blocking" or "incomplete" variety; they do not cause agglutination of Duffy positive cells suspended in sodium chloride solution or in albumin, and they can be detected only by means of the indirect Coombs test. This presents a difficult problem in the operation of a blood bank, since the usual cross matching procedures, whether performed in sodium chloride solution or in high-protein mediums such as albumin, plasma, or serum, do not detect the Duffy antibodies. Moreover, even the trypsin techniques that are exceedingly useful in detecting "incomplete" antibodies to the Rh-Hr factors are ineffective in detecting Duffy antibodies. It is not feasible, and probably not necessary, at the present time to attempt to prevent the immunization of Duffy negative persons by the administration of transfusions of Duffy negative blood only, as is done in connection with the Rh factor; first, because in only a very small percentage of the Duffy negative population do antibodies develop after transfusion with Duffy positive blood, and second, because the enormous amount of specific anti-Duffy serum that would be required to type all donors and recipients of blood is not available. It would be adequate for practical purposes to institute cross matching techniques that are capable of discovering Duffy antibodies when present in the serum of the recipient. Such persons could then be given compatible Duffy negative blood, and the development of hemolytic reactions could thereby be prevented. Since the Duffy antibodies, and also other potentially dangerous antibodies such as anti-Kell and anti-Kidd, are revealed only by the indirect Coombs test, this would mean that ideally every cross matching should be checked by an indirect Coombs test performed on the mixture of the recipient's serum and the donor's cells. It may well be that such a practice, though admittedly laborious, will eventually become standard in cross matching for all blood transfusions. In the meantime, however, it is clear, from the number of new blood group factors discovered and from the increasing incidence of hemolytic transfusion reactions caused by immune antibodies to these factors, that added precautions are now necessary in the cross matching of blood of those patients that have received repeated blood transfusions. For such patients consideration should be given to the use of the indirect Coombs test as a routine cross matching procedure.

SUMMARY

A hemolytic transfusion reaction due to antibodies to the Duffy factor is reported. The need for supplementing the standard cross matching techniques to prevent such reactions is discussed.

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COUNCIL ON PHARMACY AND CHEMISTRY

REPORT OF THE COUNCIL

The Council has authorized publication of the following report. R. T. Stormont, M.D., *Secretary.*

ANTABUSE® (DISULFIRAM) IN THE TREATMENT OF ALCOHOLISM

Antabuse® is the registered trade name of Ayerst, McKenna, and Harrison, Ltd. for its brand of the purified chemical compound tetraethylthiuram disulfide. It is marketed in the form of scored tablets each containing 0.5 gm. for oral administration as an adjunct in the treatment of chronic alcoholism. The firm has not submitted the product for consideration by the Council although it has now become generally available on prescription following three years of intensive investigational trial in the United States and Canada.

The drug was introduced from Denmark where, in 1948, its toxicity as a vermifuge was tested clinically by scientific executives of the Danish firm, Medicinalco. This led to the chance observation that the drug produces highly unpleasant reactions when taken prior to ingestion of a moderate amount of alcoholic beverage. The drug has since been employed in Scandinavian countries and other parts of the world as an adjunct to the psychotherapeutic management of chronic alcoholism. The World Health Organization has adopted for the International Pharmacopoeia the generic name disulfiram to designate the compound tetraethylthiuram disulfide.

Disulfiram interferes with "normal" metabolic degradation of alcohol in the body. Thus, the acetaldehyde concentration in the blood of patients receiving disulfiram is found to be significantly higher following ingestion of alcohol than that found when the same amount of alcohol is given to persons who have not received the drug. Correlation of the acetaldehyde level with the unpleasant symptoms that follow ingestion of alcohol in patients treated with disulfiram has been confirmed by observing the effect intravenous administration of acetaldehyde has on untreated subjects. Perfusion experiments indicate that the principal effect of the drug is upon enzyme systems of the liver. It does not affect the rate of alcohol elimination from the body.

Disulfiram is slowly absorbed by, and subsequently slowly excreted from, the intestinal tract. It must be taken at least 12 to 24 hours prior to a test dose of alcohol to produce the desired unpleasant effect. Only approximately 20% of a 2 gm. dose is excreted in the feces during the first two or three days following administration. Symptoms have followed the ingestion of alcohol seven to eight days after a single dose of 1.5 gm. of the drug, indicating that it has a prolonged effect. Disulfiram has not been found in the urine, and following administration of 1.5 gm. no increase in the urinary sulfur/nitrogen ratio has been detected. The signs and symptoms following ingestion of alcohol by patients treated with disulfiram usually begin within 5 to 15 minutes and in the following order: flushing, sweating, palpitations, dyspnea, hyperventilation, accelerated pulse rate, fall in systolic and diastolic blood pressure, nausea, and ultimately vomiting. Nausea generally is experienced 30 to 60 minutes after appearance of cardiovascular symptoms. Drowsiness follows, usually with complete recovery after sleep. The intensity and duration of symptoms during the reaction to alcohol depend on the dosage of disulfiram, the amount of alcohol taken, and the individual response. All types of alcoholic beverages (including alcoholic preparations misused as beverages) will produce a reaction in patients treated with disulfiram when the blood alcohol concentration is increased to as little as 5 to 10 mg. per 100 cc. Symptoms are usually fully developed with a blood alcohol level of 50 mg. per 100 cc.; unconsciousness usually occurs when the alcohol level reaches 125 to 150 mg. per 100 cc. Some patients with a history of tolerance to heavy consumption of alcohol who are placed on disulfiram therapy may at first take amounts of alcohol somewhat larger than the usual trial dose of 15 to 45 cc. of 100 proof whisky (or its equivalent) without experiencing severe malaise. Usually, in such cases, tolerance to alcohol tends to disappear with continued administration of the drug. Prolonged therapy with disulfiram does not produce tolerance to the drug, and the symptoms following the subsequent ingestion of alcohol are usually more acute the longer the drug is given. In the more severe cases, the reaction may persist for several hours or for as long as there is alcohol in the blood.

The employment of disulfiram in the management of chronic alcoholism requires the consent and full knowledge of the patient coupled with the application of psychotherapeutic measures designed to rehabilitate the patient. It should be emphasized that disulfiram alone cannot be expected to remove the underlying maladjustment; hospitalization, psychiatric care, and attention to complicating disease are sometimes essential if the patient is to achieve emancipation from alcohol. Disulfiram serves primarily as a "sobering crutch" on which the alcoholic may lean while a sincere effort is made to remove the underlying desire for alcoholic intoxication. In this respect, it is similar in function to the use of drugs such as amphetamine which depress the appetite as an aid to the control of excessive food intake in obesity. Amphetamine and related cerebral stimulant drugs are sometimes employed also as adjuncts in the rehabilitation of chronic alcoholics to overcome associated depressive and anxiety states. The pleasant effect of such stimulants is in contrast with the unpleasant reaction induced by means of disulfiram.

Patients should not consume any alcoholic beverage for at least 24 hours before disulfiram therapy is initiated, and it is particularly important to withhold the drug when the patient is intoxicated. During this period every effort should be made to restore the patient to a normal physical condition, obtain a complete history (preferably in the presence of a friend or relative), and to inculcate the attitude that excessive use of alcohol requires treatment. If the risk of therapy with disulfiram is outweighed by the seriousness of chronic alcoholism in any individual case, the patient should be placed on a suitable schedule of dosage adjusted to the smallest amount which will cause a slight flushing, slight increase of pulse rate, and mild dyspnea of 15 to 20 minutes duration following the ingestion of a single trial dose of alcohol. The patient should be kept under close observation during the initial stage of treatment. Physicians should become thoroughly familiar with the dosage of the drug and the alcohol test procedure before prescribing this form of therapy. If the patient reverts to the use of alcohol, 12 hours from the last drink should elapse before therapy is resumed, and this also should be under direct observation of the physician.

The weekly or periodic type of drinker is considered more apt to relapse than the habitual or occasional drinker. It may be advisable to have such patients observe, at intervals, the reaction of another patient under treatment as a reminder of the unpleasant consequences of drinking. When there are relative contraindications to the drug-alcohol reaction, the trial with alcohol should be eliminated. The effectiveness of disulfiram as a deterrent to drinking lies in creating fear of a reaction, not in the development of actual aversion to alcoholic beverages.

Disulfiram is of low toxicity when used in the recommended dosage and no deaths have been reported which are attributable to the drug alone. Although there are no known absolute contraindications to disulfiram, extreme caution in its use is necessary. The alcohol test is usually omitted if it is to be employed in the presence of the following conditions: diabetes mellitus, myocardial failure or coronary disease, pregnancy, goiter, epilepsy, cirrhosis of the liver, and chronic or acute nephritis. Similar caution should be exercised when addiction to narcotics is superimposed on alcoholism. When sedation is required, strict supervision is necessary to prevent the development of habituation to barbiturates as a substitute for alcoholism. There is also some evidence to indicate that disulfiram prolongs the action of barbiturates so that it is best to avoid sedatives of this group, especially the intravenous use of derivatives. Disulfiram should not be used in patients recently treated with paraldehyde; conversely, paraldehyde should not be given to patients treated with disulfiram. Disulfiram may produce a calming effect conducive to sleep that may lessen the need for sedative drugs. Some patients receiving disulfiram complain of mild drowsiness, fatigability, impotence, headache, or peripheral neuritis, but such symptoms tend to subside with continuation of the drug at a reduced dosage. Because neurologic changes have been observed in animals and toxic psychoses have been observed with larger doses in human beings, it is important to keep the initial dosage at 0.5 gm. or less for the first two or three weeks, and not to exceed the recommended maintenance dosage of 0.25 gm. daily. If drowsiness or impairment of mental acuity occurs, the dosage should be decreased. Rare instances of skin eruption following disulfiram have been reported, but such adverse effects can usually be controlled by the concomitant administration of one of the antihistaminic drugs. The alcohol test must not be given to patients with myocardial failure, coronary disease, or pregnancy and is not recommended for patients over 50 years of age.

Unduly severe and alarming reactions to alcohol in patients on disulfiram therapy have been reported. These reactions have consisted chiefly of cardiovascular complications involving an unusual fall in blood pressure, cardiac arrhythmia, electrocardiographic evidence of myocardial ischemia, and even myocardial infarction. Usually these have been caused by excessive trial doses of alcohol or by surrepetitious drinking during the initial stages of treatment. This emphasizes the importance of continuous medical supervision. Physicians should warn the patient against drinking during treatment and instruct relatives concerning the danger of secret administration of the drug because of the consequences of overdosage or the exaggerated effect of the drug in the presence of intoxication. Measures which have been suggested to control or lessen the severity of alarming reactions include the intravenous and oral administration of ascorbic acid in doses of 1 gm., inhalation of oxygen or a mixture of 95% oxygen and 5% carbon dioxide, and parenteral administration of ephedrine sulfate. It also has been suggested that every patient under treatment should carry an identification card to that effect, indicating the symptoms most likely to occur following consumption of alcohol, together with the name of the physician or institution to be called in case of emergency. Recently, it has been reported that physicians should be on guard against severe personality changes which may be encountered as a concomitant of the sudden withdrawal of alcohol imposed by disulfiram, particularly when the drug is administered against the wishes of the patient.

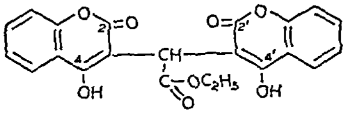
Physicians who are unwilling or unable to institute other appropriate measures for the physical, emotional, and social rehabilitation of the alcoholic should not prescribe the drug. Likewise, patients who are unwilling, or for reasons beyond the effect of the drug are unable, to cooperate should not be placed on therapy with disulfiram. Without a sincere desire to stop drinking and to follow the treatment as prescribed by the physician, the drug alone provides little chance for a cure. In such circumstances it may do more harm than good. As with other aids in the management of chronic alcoholism, ultimate success depends on correction of the underlying maladjustment of the individual. It is concluded that disulfiram may become established as a useful adjunct in the management of selected and adequately supervised cases of chronic alcoholism.

NEW AND NONOFFICIAL REMEDIES

The following additional article has been accepted as conforming to the rules of the Council on Pharmacy and Chemistry of the American Medical Association for admission to New and Nonofficial Remedies. A copy of the rules on which the Council bases its action will be sent on application.

R. T. STORMONT, M.D., *Secretary.*

Ethyl Biscoumacetate.—Tromexan Ethyl Acetate (Geigy).—$C_{22}H_{16}O_8$.—M.W. 408.35.—3,3′-Carboxymethylene bis-(4-hydroxycoumarin) ethyl ester.—The structural formula of ethyl biscoumacetate may be represented as follows:



Actions and Uses.—Ethyl biscoumacetate is a synthetic derivative of bishydroxycoumarin and similarly produces anticoagulant action by lengthening the prothrombin time through reduction of the prothrombin concentration of the blood. See the monograph on Bishydroxycoumarin.

Ethyl biscoumacetate is effective orally, alone, or as an adjunct to heparin sodium, for the prevention and treatment of conditions characterized or complicated by intravascular clotting. Compared with bishydroxycoumarin, ethyl biscoumacetate possesses the advantages of more rapid absorption, action, detoxification, and excretion, as well as shorter action and reduced cumulative effect. These properties provide greater safety. Reduced cumulative effect does not imply complete freedom from the danger of cumulative action inherent in the use of internal anticoagulants. Physicians must guard carefully against overdosage to avoid the development of hemorrhagic complications. The drug is contraindicated in the presence of hemorrhagic diathesis and should be used with caution in patients with impaired hepatic or renal function.

Dosage.—1.5 gm. orally at once or in divided doses, is recommended as the average adult dose for the initial 24-hour period of treatment; subsequently, adults usually require 0.6 to 0.9 gm. each day. With these amounts a therapeutic degree of hypoprothrombinemia is usually achieved within 18 to 24 hours. A more even prothrombin level may be maintained by administering the total daily amount in divided doses. In patients with impaired hepatic or renal function, or in whom an exaggerated response is anticipated, a smaller than average initial dose is advisable. Following the initial dosage, maintenance doses should be regulated by the results of blood prothrombin determinations. When anticoagulant therapy is used in the hospital or for ambulatory patients, the need for close supervision with frequent determinations of the prothrombin time is essential; for most purposes it is customary to prolong the prothrombin time to two or two and one-half times the normal. Daily determinations should be made during the first several days of treatment to determine the safe and effective dosage for each patient. Thereafter, determinations on alternate days or once or twice weekly may be sufficient. Prothrombin levels of 30 to 50% are considered satisfactory by some investigators; values below 10 to 15% are within the danger zone. It is customary to maintain a prothrombin time of 35 seconds, but when this is exceeded, the dosage should be reduced. When the situation requires more prompt anticoagulant effect than can be obtained by use of ethyl biscoumacetate alone, an initial injection of heparin sodium may be administered to institute therapy.

The action of the drug may be enhanced by the administration of salicylates which depress the prothrombin level. Overdosage should be treated by prompt withdrawal of the drug, intravenous administration of vitamin K, and repeated transfusions of fresh, whole, citrated blood or plasma until the prothrombin level returns to a safe concentration. Elevations of prothrombin time to 75 seconds not associated with hemorrhage usually return to a near normal range within 12 to 24 hours by prompt withdrawal of the drug only.

Tests and Standards.—

Physical Properties: Ethyl biscoumacetate is a white, odorless, bitter, crystalline solid which melts between 177 and 182°. Another form of the solid exists which melts between 154 and 157°. It is soluble in acetone and benzene, slightly soluble in alcohol and ether, and insoluble in water.

Identity Tests: Dissolve 25 mg. of ethyl biscoumacetate in 5 ml. of alcohol. Add 0.5 ml. of ferric chloride T.S.: the solution turns reddish brown.

To 50 mg. of ethyl biscoumacetate, add 3 ml. of sulfuric acid and heat: the solution turns orange. Add 2 drops of the orange solution to two 5 ml. portions of water. To one portion, add 5 ml. of 2 *N* sodium hydroxide: the solution turns yellow on standing. To the other portion, add 5 ml. of 2 *N* ammonium hydroxide: no color change occurs.

To 0.2 gm. of ethyl biscoumacetate, add 2 ml. of 2 *N* sodium hydroxide. Allow to stand for 1 hour. Add 4 drops of iodine T.S.: the odor of iodoform is noticeable.

Purity Tests: Add 0.5 gm. of ethyl biscoumacetate to a tared 15 ml. centrifuge tube. Add 10 ml. of 2 *N* ammonium hydroxide and stir the contents with a finely pointed stirring rod. Centrifuge the tube for 5 min. at about 4000 rpm. Pour off the solution and remove the remains of the solution from the walls of the vessel with filter paper. Add 3 ml. of 2 *N* ammonium hydroxide and 3 ml. of water to the precipitate, stir the contents and centrifuge. Finally, wash with water in the same manner. Dry the tube with the precipitate at 105° for 2 hours. Cool and weigh: the residue of 3,3′-carboxymethylene bis-(4-epoxycoumarin) ethyl acetate is less than 1.4%.

Estimate the amount of 3,3′-carboxymethylene bis-(4-hydroxycoumarin) present by subtracting from 100% the sum of the percentages of 3,3′-carboxymethylene bis-(4-epoxycoumarin) and of ethyl biscoumacetate as determined in the assay, which is described later.

Dry about 0.5 gm. of ethyl biscoumacetate at 105° for 4 hours: the loss in weight is not more than 0.3%.

Ignite about 0.5 gm. of ethyl biscoumacetate: the amount of residue does not exceed 0.1%.

Assay: Add 10 ml. of 2 *N* sodium carbonate and 40 ml. of water to 0.8 gm. of ethyl biscoumacetate and stir for 5 min. Filter with the aid of suction through a fritted glass filter and wash the precipitate with three 10 ml. portions of water. Transfer the filtrate to a 250 ml. round-bottomed flask, rinsing the suction flask with 20 ml. of water. Add 25 ml. of about 10 *N* sodium hydroxide and add porous boiling chips. Connect the flask to an inverted U-tube by means of a ground-glass joint. Join the other end of the U-tube to a condenser by means of a ground-glass joint or seal them together. Distil about 95 ml. of the solution over a period of 1.5 hours into a 100 ml. volumetric flask cooled in an ice-water mixture. Adjust the volume to 100 ml. with water. Pipet 25 ml. of the distillate and 25 ml. of 0.1 *N* potassium dichromate into an Erlenmeyer flask. Attach a short water condenser, preferably by means of a ground-glass joint, and cool the flask in an ice-water mixture. Slowly add 25 ml. of sulfuric acid through the condenser and warm the flask for 30 min. on a steam bath. Cool the flask, and rinse the condenser and sides of the flask with 100 ml. of water. Add 25 ml. of 0.5 *N* potassium iodide and allow it to stand in the dark for 5 min. Titrate the solution with 0.1 *N* sodium thiosulfate, using freshly prepared starch-potassium iodide T.S. as an indicator. Toward the end of the titration, add the sodium thiosulfate slowly with vigorous stirring to a pale blue endpoint. Each milliliter of 0.1 *N* potassium dichromate consumed is equivalent to 0.1021 gm. of ethyl biscoumacetate. The amount of ethyl biscoumacetate present is between 96.0 and 100.0%.

Dosage Forms of Ethyl Biscoumacetate

TABLETS. *Identity Tests:* To an amount of powdered tablets equivalent to about 0.5 gm. of ethyl biscoumacetate, add 50 ml. of acetone. Warm the mixture and cool. Filter and distil the acetone from the filtrate. Dry the residue at 105° for 15 min. The residue responds to the identity tests in the monograph for Ethyl Biscoumacetate.

Assay: (Ethyl Biscoumacetate) To an amount of powdered tablets equivalent to about 0.8 gm. of ethyl biscoumacetate, add 50 ml. of acetone. Warm the mixture and cool it. Filter the mixture through a fritted glass filter and wash the residue with four 10 ml. portions of acetone. Distil the acetone from the filtrate and dry the residue at 105° for 15 min. Proceed with the assay as directed in the monograph for Ethyl Biscoumacetate. Each milliliter of 0.1 *N* potassium dichromate consumed is equivalent to 0.01021 gm. of ethyl biscoumacetate. The amount of ethyl biscoumacetate present is between 94.0 and 105.0% of the labeled amount.

Geigy Company, Inc., New York

Tablets Tromexan Ethyl Acetate: 0.15 gm. and 0.3 gm. U. S. Patents 2,482,510, 2,482,511, and 2,482,512.

study was based on previous observations [3] that alopecia areata, like rheumatoid arthritis, sometimes undergoes complete remission during pregnancy when the secretion of corticotropin and cortisone is increased. After unsuccessful trials with the usual short courses of cortisone, the University of Chicago workers found that regrowth of hair occurred regularly after three or four weeks of therapy. The hair continued to grow as long as adequate doses of cortisone were given but began to fall out again when the dose was reduced below a critical level that varied with the patient and with the activity of the disease. With continuous low dosage therapy hair growth has now been maintained in a number of patients for 6 to 10 months, but relapse has occurred in other patients who were unable to tolerate the maintenance dose required. Patients not responding initially were those whose alopecia began or was active at the time of puberty, suggesting that the hormonal changes occurring at that time aggravate the disease process. It is known that the prognosis of alopecia areata is worse when the onset occurs before puberty than when it occurs afterward.[3d] Patients with alopecia of many years' duration would not be expected to respond to therapy, since irreversible atrophy of hair follicles may eventually occur.

It is not yet known whether permanent remissions can be obtained by this method nor whether long-term maintenance therapy with its potentiality for harmful side-effects is advisable in any but the smallest doses, in a disease that does not affect the general health. Until these questions can be answered, the administration of cortisone and corticotropin in alopecia areata must be regarded as a research procedure. Moreover the popular clamor for the use of these hormones in ordinary male baldness should be discouraged, since there is no evidence that they have any effect in this condition.

EDUCATIONAL TELEVISION CHANNELS

The growth of television since 1948 has been phenomenal. There are now 108 stations in 63 communities, mostly urban, and it is estimated that there are at least 17 million receiving sets in operation. In many communities, television audiences now exceed radio audiences, except when some unusual event on radio reverses the trend. These facts have profoundly influenced advertising policies and are affecting educational broadcasting.

The recent order of the Federal Communications Commission lifting the so-called freeze on ultra high frequency (UHF) television channels as of April 14, 1952, will result in even more amazing developments. These UHF channels will not become available immediately for a number of reasons. To begin with, the commission is authorizing new stations only at a relatively slow rate for the present, although in 1953 it is expected that a large number of licenses will be granted. On the first business day after the lifting of the freeze, the FCC received 1,000 applications before the morning had passed.

These new channels will be allotted first to communities now having no television and then in succession to other areas in order of the number of stations. Areas like New York, with its existing nine channels, Chicago with four, Los Angeles with five, and other major centers will receive their new channel allocations last.

A feature of the new FCC order, which is of special interest to medical societies, is the provision for so-called education channels. Each community where agencies exist that might be expected to utilize a television channel will receive an initial allocation of one channel to be used exclusively for educational purposes. This is an initial and not a permanent allotment; if educational institutions do not take steps to utilize this channel by applying for a license and showing evidence of financial and programming capacities, the commission may allot this channel for commercial use. Once it is gone, it is gone forever. As Chicago commentator Clifton Utley stated in a discussion of this subject, "The bus passes once."

The American Medical Association was early in the field with radio and has maintained leadership in this regard ever since with many nationwide broadcasts, special events broadcasts from annual and clinical sessions, and the most extensive health transcription service in existence. The A. M. A. also participated in experimental television in Chicago from its beginning. The Bureau of Health Education has developed a handbook on television, and it held the only nationwide meeting on health education in television in New York, in October, 1951. The Association has had several nationwide telecasts. A number of local medical societies have entered the television field successfully. Television is by nature a local medium, especially in its educational phases. The time may come when educational stations can be linked by network facilities, but in the beginning educational television stations will necessarily be local, and programming, therefore, must also be local.

The time is now opportune for the formation of local groups to preempt the available educational channels while there is yet time. Television is an extremely expensive medium. Counting all the necessary personnel, such as camera men, floor directors, electricians, scene setters, producers, timers, switchers, and personnel connected with control rooms and microphone control on the floor, it takes from 12 to 18 persons to bring to the television screen as simple a program as a newscast, which may show only an announcer. The equivalent program in radio would require a total of perhaps three to five persons. It is therefore extremely unlikely that any educational institutions, except large universities and public school systems, will be able alone to maintain educational telecasting. It will probably be necessary to have a community group, probably formed into a corporation, in which universities and other community groups interested in health will participate financially and in programming. This is already happening in some areas.

If medicine is to have its place in educational television, state and local medical societies will need to act now to ally themselves with these agencies or even to stimulate development of local organizations in order to insure a voice and a picture on television.

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2. Wilson, R. A.: Effect of ACTH on Hair Growth in Alopecia Areata and Universalis, Lancet **1**: 646 (March 29) 1952.

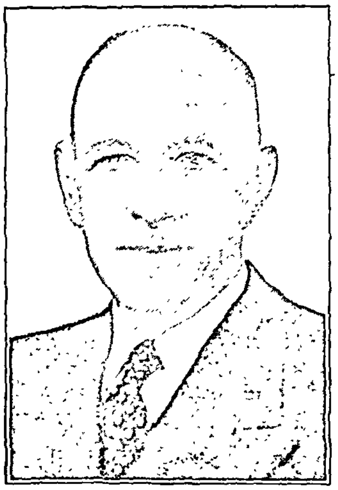
3. (*a*) Meachen, G. N., and Provis, F. L.: Case Presentation Before Royal Society of Medicine, Brit. J. Dermat. & Syph. **24**: 272, 1912. (*b*) Strandberg, J.: Haut und Geschlechtskrankheiten, Berlin, Julius Springer, 1929, vol. 3, p. 211. (*c*) Waisman, M., and Kepler, E. J.: Alopecia Areata, An Appraisal of Endocrine Factors in Its Causation, J. A. M. A. **116**: 2004 (May 3) 1941. (*d*) Walker, S. A., and Rothman, S.: Alopecia Areata: A Statistical Study and Consideration of Endocrine Influences, J. Invest. Dermat. **14**: 403 (June) 1950.

THE PRESIDENT'S PAGE

A MONTHLY MESSAGE

Of all criminals, the worst, in my opinion, are those who prey on sick and suffering persons. The quack robs his victims by accepting payment for treatment he knows is worthless. He exploits their natural fears by "diagnosing" illness, even when it is not present, and then guaranteeing a "cure" for a price. If the patient is seriously ill, the quack is actually a murderer. By continuing his worthless treatment and providing false hope, he prevents the patient from seeking proper attention until it is too late.

The American Medical Association throughout its history has fought these charlatans and the nostrums they employ. Its attention was first centered on the brisk traffic in secret remedies, which was widespread at the time the Association was organized in 1847. I have previously described the pioneering work of our Council on Pharmacy and Chemistry in testing and evaluating drugs—which work has been responsible, together with the activities of the Federal Food and Drug Administration, in bringing order out of the chaos that existed in the drug field. I have also described the efforts of our Council on Medical Education and Hospitals to raise standards of education and licensure so that incompetent persons are not allowed to practice medicine. No matter how well-regulated and scrupulous the production and distribution of drugs and devices may be, however, and no matter how strict is licensure for the practice of the healing arts, there are always quacks and charlatans who evade rules and regulations and profit from their trade in human misery. For this reason the A. M. A. has, since 1906, operated a sort of medical FBI, the Association's Bureau of Investigation.



This bureau is headed by a lawyer who is a trained investigator. It is charged with the responsibility of uncovering quacks, medical fads, and fraudulent treatments and exposing them by educational and informational methods. More than half a million index cards are the keys to the voluminous files of the Bureau, which cover many thousands of subjects. These include information on persons, their schemes, products and careers, who form the unscrupulous and unscientific side of medicine and healing. The Bureau of Investigation compiles these records in several ways. It conducts original investigations. It receives information from federal sources such as the Food and Drug Administration, Post Office Department, and Federal Trade Commission. State licensing boards and state and municipal boards of health regularly submit data. Some information is received from individual physicians and the general public. The various reports are cross indexed in several different ways, for often a quack will be forced to leave one state only to set up practice in another state under another name. He may even switch his line from cancer "cures" to treatments for anemia or "that tired feeling." Like other criminals, however, medical charlatans have certain behavior patterns and can often be identified by them.

Since the Bureau serves as a national clearinghouse for information on pseudo-medicine, it receives thousands of inquiries every year. Answering these letters is the chief way in which the Bureau disseminates its data. Letters are received from physicians, from law enforcement officials, from better business bureaus, and from victimized persons or their friends and relatives.

The Bureau does not itself prosecute quacks, but it frequently provides the necessary evidence that leads to conviction. The A. M. A. consequently has, over the years, been sued for several million dollars in damages. With the exception of one case, the suits that have been brought to trial have been unsuccessful. In the exception, damages in the amount of only one cent were awarded! It is a frequent practice of quacks to announce to the press that they are going to sue for some astronomical sum in order to vindicate themselves. In most of these cases, after the plaintiffs have garnered their newspaper clippings, nothing more is heard of the suit.

In addition to answering letters, the Bureau disseminates information to the public by assisting newspapers and magazines in preparing articles on quackery. In the past year, for example, several writers for national magazines have obtained pertinent data for stories on quacks and faddists. The Bureau also has assisted metropolitan newspapers with series of articles exposing various charlatans operating in the cities they serve. Responsible publications often consult the Bureau about questionable medical advertising that they are asked to accept.

As the Bureau compiles material on various charlatans, medical fads, and nostrums, it publishes reports to the profession in THE JOURNAL. These are sometimes reprinted in pamphlet form. All such information is made readily available to other groups wishing to use it; for example, much of the material in the Better Business Bureau's excellent new booklet "Facts About Health Cures" was supplied by the A. M. A. This has received wide distribution.

In cooperation with A. M. A.'s Bureau of Exhibits, the Bureau of Investigation has prepared a fascinating exhibit on mechanical quackery. It includes a "radioclast," a complicated machine with many dials and lights that is a favorite of some chiropractors for both "diagnosing" and "treating" disease; the Vrilium tube, which was once used by prominent Chicago politicians as a "health charm"; and other worthless devices. This exhibit is shown at A. M. A. meetings and is available on a loan basis for other medical meetings, state fairs, and conventions.

The Bureau always appreciates an "assist" from individual physicians in its educational efforts. It will gladly provide material for talks on quackery and has both a film strip and lantern slides available to illustrate such speeches. The subject is entertaining as well as educational and is a welcome topic for presentation before service clubs and other organizations.

Physicians can also assist the Bureau by reporting any suspicious practitioners in their locality. Often the Bureau can provide information about the quack that the county medical society can then turn over to local law enforcement officials. If the Bureau has no information on the quack as yet, the report is a valuable addition to its files.

As physicians, we are vitally concerned with the health of the people in our communities. We can promote their health by support of sound health education programs in the schools, by authentic health columns in local papers, and by talks on medical subjects before civic organizations. Sound health education is preventive medicine against quacks and against self-doctoring with patent remedies. In addition to such positive action, the medical profession has a responsibility to expose charlatans and to make efforts, through proper law enforcement channels, to put them out of business. The Bureau of Investigation of the American Medical Association is anxious to help any physician or medical society in such efforts.

JOHN W. CLINE, M.D., San Francisco.

ORGANIZATION SECTION

COMMITTEE ON LEGISLATION

At its meeting on March 22, 1952, the Committee on Legislation of the American Medical Association took final action on 16 different legislative proposals, recommending either approval or disapproval. All of the recommendations of the Committee were accepted by the Executive Committee of the Board of Trustees on April 14, 1952. Following is a brief résumé of the measures proposed by the 82d Congress and considered by the Committee, with the position of the Association in each instance.

C. Joseph Stetler, Secretary
Committee on Legislation.

S. 2247

Introduced by Senator Lehman of New York and referred to the Senate Committee on Labor and Public Welfare.

Digest of Bill.—The bill would amend the Public Health Service Act to enable the Surgeon General to provide monetary grants to states and other local political subdivisions to maintain outpatient services in hospitals and health centers for the detection and treatment of disease. The bill would also subsidize home-care service and community planning for the ambulatory sick, as well as for demonstrations and the training of personnel.

Association Position.—At its meeting on Dec. 4, 1951, the Committee voted opposition to this bill but referred it to the Council on Medical Service for further study and report.

After receiving the report of the Council on Medical Service, the Committee voted to sustain its original position on this bill because, if enacted, it would tend to extend the functions of governmental public health units into the general medical care field. The bill is not in accord with the principles of the American Medical Association in that: 1. There is no provision requiring that economic need be shown to exist by individuals and the states before assistance is extended or before grants are made. 2. No definitions are provided as to the medical services to be provided. 3. The bill includes early detection programs such as are now being carried on by various organizations. 4. The Surgeon General of the United States Public Health Service could extend his field in regard to local health activities in almost any direction and still remain within the provisions of the bill.

S. 2409

Introduced by Senator Neely of West Virginia and referred to the Senate Committee on Labor and Public Welfare.

Digest of Bill.—The bill would authorize the President to mobilize a group of outstanding experts and to coordinate and use their services in an effort to discover means of curing and preventing cancer. An initial appropriation in the amount of 100 million dollars would be authorized by the bill for this program.

Association Position.—The Association opposes this bill because of its belief that the system proposed would be ineffective in discovering a cure for cancer.

A large part of the funds and research efforts of individuals, private institutions, and government agencies is being directed to the detection of the causes of and a cure for cancer. It does not appear, therefore, that the creation of a new governmental research agency in this field would expedite the accomplishment of the desired results.

S. 2465 (identical bill: H. R. 5892)

Introduced by Senator Johnson of Colorado and referred to the Senate Committee on Finance.

Digest of Bills.—The bills would amend Veterans Regulations no. 1 (*a*) to establish a rebuttable presumption of service connection for active tuberculosis, psychosis, and multiple sclerosis developing a 10% or more degree of disability within three years after separation from active service.

Association Position.—The Association opposes the bills because they represent another effort to further liberalize existing Veterans Administration regulations regarding the presumption of service connection.

The continuation of such a policy of liberalization will not only result in a distortion of the theory on which compensation benefits are based but will also result in the extension of hospitalization and medical care benefits to veterans with disabilities that are in actuality not service connected, regardless of their ability to pay for such care from private sources.

S. 2705 (identical or similar bills: H. R. 6213, H. R. 6750, H. R. 6751, H. R. 6752, and H. R. 6753)

Introduced by Senator Lehman of New York and referred to the Senate Committee on Finance.

Digest of Bills.—The bills would amend the Social Security Act so as to (*a*) provide Old-Age and Survivors' Insurance benefits for approximately 11 million additional persons, consisting of farm owners and workers, domestic employees, members of the armed forces, and certain government employees (self-employed physicians and certain other professional persons would not be included); (*b*) increase Old-Age and Survivors' Insurance benefits approximately 35%; (*c*) raise taxable wages from $3,600 maximum to $6,000; (*d*) increase employer and employee tax to 4% each by 1961 (self-employed, 5¼%); (*e*) provide permanent and total disability and temporary cash sickness benefits; and (*f*) provide a broad rehabilitation program for social security beneficiaries. The rehabilitation program provided by the bill would authorize the federal subsidization of state plans without matching funds.

Association Position.—The Association opposes these bills. The broad provisions with respect to increased benefits under the Old-Age and Survivors' Insurance provisions of the Social Security Act, the extension of coverage, and the increase in payroll taxes do not have primary medical implications, and therefore the Association has not taken a position with respect thereto. However, the absence of a positive position on these provisions should not be interpreted as an endorsement of them by the Association.

The Association is definitely opposed to the proposed amendments to the Social Security Act providing for permanent and total disability and cash sickness benefits and a broad rehabilitative program for Social Security beneficiaries.

The initiation of a federal disability benefit program would represent a major step toward the wholesale nationalization of medical care and the socialization of the practice of medicine. The provisions in these bills regarding disability certification would establish an inferior type of physician-patient relationship, which, along with the entire program, would undoubtedly result in a deterioration of medical care.

S. 2714

Introduced by Senator Murray of Montana and referred to the Senate Committee on Labor and Public Welfare.

Digest of Bill.—The bill would authorize the expenditure of federal funds to states on a matching basis for industrial safety programs. The amounts payable to the various states would be based on population, the number of wage earners, special industrial hazards, the area of protection, the cost of state administration, and the financial needs of the states.

The Secretary of Labor would be charged with the responsibility for administering the program and for passing on the acceptability of state industrial safety plans.

Association Position.—The Association opposed this bill for the following reasons: 1. A program such as this should be under the United States Public Health Service rather than the Department of Labor. 2. The bill gives undue power to a federal agency. 3. It is not possible to separate safety measures from industrial medicine. 4. Complete administrative control is vested in the federal government.

S. 2731 (identical bill: H. R. 6724)

Introduced by Senator Russell of Georgia and referred to the Senate Committee on Labor and Public Welfare.

Digest of Bill.—The bill would authorize the Administrator of Veterans' Affairs and the secretaries of the Army, Navy, and Air Force, with the approval of the President and Secretary of Defense, to transfer hospitals, facilities, equipment, etc., between the Veterans Administration and the armed services.

Association Position.—The Association approves the bill because of its belief that in providing federal medical and hospital services there should be an allocation of beds and hospitals in an effort to attain the greatest economy. It is not now possible for the Department of Defense to take over Veterans Administration hospitals without a transfer of funds. It is the belief of the Association that such an action might be desirable under certain conditions.

S. 2780

Introduced by Senator Thye of Minnesota and referred to the Senate Committee on Interior and Insular Affairs.

Digest of Bill.—The bill would transfer all functions, duties, and responsibilities relating to the maintenance and operation of hospitals on Indian reservations and the conservation of the health of Indians from the Department of the Interior to the United States Public Health Service.

Association Position.—The Association approves the bill because it believes that the present system under the Department of the Interior is poor and that this bill incorporates a proper move toward a consolidation of the federal medical services. Under present conditions, one of the major problems of the Indian Service is securing adequate medical staffs for the hospitals. If the hospitals are made a part of the United States Public Health Service, it is probable that physicians would be more willing to be assigned to these duties and these institutions.

H. R. 4912

Introduced by Representative Perkins of Kentucky and referred to the House of Representatives Committee on Education and Labor.

Digest of Bill.—The bill would establish the Federal Agency for the Handicapped, to provide various types of rehabilitative services to persons physically or mentally handicapped.

The agency would absorb the functions of the Office of Vocational Rehabilitation, the Division of the Physically Handicapped in the Bureau of Labor Statistics, the functions of the Library of Congress in furnishing aid for the blind, and the functions of the Federal Security Agency with respect to the Vocational Rehabilitation Act and state grants for aid to the blind. The new agency also would coordinate all other rehabilitative measures for the benefit of handicapped persons administered by other agencies of the government.

Association Position.—The Association reiterated its opposition to this bill (reported in The Journal, Feb. 9, 1952, page 473). In addition to the objections originally stated for opposing the measure, the following reasons were cited: 1. The bill would concentrate greater authority over rehabilitation in a federal agency as against strengthening state and local autonomy and responsibility through local means. 2. The absence of specifications in the bill regarding medical participation in administration, policy making, advisory functions, and auxiliary services. 3. The difficulties associated with the certification of total disability administratively and medically, on which monthly payments would be based. 4. The fact that the favorable features of the bill could be readily fitted into existing administrative framework without the expense and confusion of a changeover.

H. R. 5871

Introduced by Representative Bosone of Utah and referred to the House of Representatives Committee on Armed Services.

Digest of Bill.—The bill would establish two types of programs: (1) an emergency maternity and infant care program for wives and for children under 5 years of age of enlisted personnel of the armed forces and (2) a program of hospital care for any dependent of enlisted personnel of the armed forces. These programs would be financed by the federal government and the states on a 50-50 basis.

Association Position.—The Association opposes this bill, which is identical with S. 2337, 82d Congress (reported in The Journal, Feb. 9, 1952, page 473) on which testimony was given on March 12, 1952, to the Senate Committee on Armed Services. The prepared statements presented to the Congress by Drs. E. S. Hamilton and W. L. Crawford were reproduced in their entirety in the March 22 issue of The Journal, page 1037.

H. R. 6185

Introduced by Representative Elliott of Alabama and referred to the House of Representatives Committee on Interstate and Foreign Commerce.

Digest of Bill.—The bill would amend various existing laws for the stated purpose of providing federal assistance for nursing education. The bill would authorize the Public Health Service to administer four new types of benefits: (*a*) annual payments for the cost of nursing instruction, (*b*) grants for constructing and equipping new nursing schools, (*c*) nursing scholarships, and (*d*) federal subsidization of special projects and recruitment in the field of nursing. The bill also provides for grants to states to assist in the establishment and maintenance of plans for practical nurse training.

Association Position.—The Association opposes this bill, which is similar to H. R. 910, 82d Congress, on which testimony was presented on Sept. 13, 1951, to the House Interstate and Foreign Commerce Committee. The Association is opposed to the bill primarily because it would authorize federal intervention in the field of education and would permit continuing federal support for a program that is a local responsibility. In addition, the bill would place unwarranted administrative authority in the Federal Security Agency.

H. R. 6212

Introduced by Representative Bonner of North Carolina and referred to the House of Representatives Committee on Merchant Marine and Fisheries.

Digest of Bill.—The bill would authorize and direct the Commandant of the United States Coast Guard to furnish hospitalization and medical, surgical, and dental care and treatment for dependents of all uniformed personnel of the United States Coast Guard.

Association Position.—The Association opposes this bill because medical care and hospitalization is being furnished to dependents of service personnel without clear-cut congressional authority. The Army, Navy, and Air Force are currently furnishing medical care for dependents of service personnel on the basis of an act passed on July 5, 1884, providing, in part, that "medical officers of the Army and contract surgeons shall, wherever practicable, attend the families of the officers and soldiers free of charge."

The wholesale extension of such care without regard to the availability of adequate civilian facilities is necessitating the induction of increased numbers of physicians into the armed services. The continued abuse of the very limited authority granted by the Congress in this field, coupled with the gradual but continuous expansion of other federal medical services, will eventually result indirectly in the socialization of medical care. In addition, the expansion and new construction of military medical installations to care for such dependents is an unauthorized and unnecessary expenditure of funds.

H. R. 6215

Introduced by Representative Celler of New York and referred to the House of Representatives Committee on Education and Labor.

Digest of Bill.—The bill would amend various existing laws dealing with federal aid to the blind and other seriously disabled persons. The purpose of the act is to authorize a comprehensive grant-in-aid program to assist the states in furnishing a variety of services to the blind and others seriously disabled.

The bill would authorize the subsidization by the federal government of state plans approved by the Federal Security Administrator, providing training, workshops, and rehabilitation centers, research and adjustment centers, job counseling, and greater employment opportunities.

Association Position.—The Association opposes this bill generally because of a growing reluctance to encourage federal grant-in-aid programs and because current federal and state programs in this field appear to be adequate. Specific reasons for disapproval of the measure include: 1. Corrective therapy as provided is not a recognized and approved category as yet in the field of ancillary personnel in rehabilitation and physical medicine. 2. The definition of a "rehabilitation center" is too limited. 3. The federal government through the states would defray the cost of vocational rehabilitation, corrective surgery, and "therapeutic treatment" for persons in such centers in the following ways: (*a*) total cost for war-disabled veterans and (*b*) one-half the cost for those needing financial assistance and others in the nonveteran category. 4. There is no definition of the limits of the severity and nature of disability (except in the case of the blind) for which these services would be rendered, and therefore a form of state medicine would be established.

H. R. 6539

Introduced by Representative Rankin of Mississippi and referred to the House of Representatives Committee on Veterans' Affairs.

Digest of Bill.—The bill would authorize and direct the Administrator of Veterans' Affairs to study the methods and practices employed by Dr. Robert E. Lincoln of West Medford, Mass., in the treatment of tuberculosis and cancer.

Association Position.—The Association opposes this bill because it is believed that the measure is superfluous and unnecessary legislation, that the bill is aimed at clinical evaluation only, and that no toxicity studies have been published concerning the bacteriophage of Dr. Lincoln.

Investigation of the treatment is being carried on at the present time by the Committee on Cancer Diagnosis and Therapy of the National Research Council.

H. R. 6720

Introduced by Representative Elliott of Alabama and referred to the House of Representatives Committee on Education and Labor.

Digest of Bill.—The bill would authorize federal grants to states on a 50-50 basis to help finance health and safety instruction and physical education for children of school age. It should be noted that the bill is silent as to which federal agency would approve state plans or administer the measure, if adopted. The word "commissioner" is used throughout the bill; however, the term is not defined.

Association Position.—The Feb. 9, 1952, issue of THE JOURNAL reported the opposition of the Association to H. R. 5853, 82d Congress, an identical bill. This opposition was reaffirmed with respect to H. R. 6720 because it (1) deals with a state and local problem, (2) provides for an unnecessary expenditure of funds, and (3) contains many technical errors.

H. R. 6856

Introduced by Representative Buckley of New York and referred to the House of Representatives Committee on Public Works.

Digest of Bill.—The bill would extend for three years (until June 30, 1956) the Water Pollution Act, which provides federal assistance to states through study, advice, and grants.

The Water Pollution Control Act provides for a nationwide program for pollution control in interstate waters and supplies federal enforcement procedures to abate pollution. It establishes a Water Pollution Control Advisory Board within the Public Health Service, but encourages adoption of interstate compacts, which would become binding on approval by Congress.

Association Position.—The Association approves the bill, because it believes that the control of pollution in interstate waters is a proper and necessary activity of the federal government. The work is necessary and has been carried on satisfactorily under the Water Pollution Act since its enactment.

H. J. Res. 381

Introduced by Representative Kennedy of Massachusetts and referred to the House of Representatives Committee on the Judiciary.

Digest of Resolution.—The resolution would authorize the use of royalties from tideland mineral leases issued by the Secretary of the Interior for "urgent developments essential to the national defense and the national security," including the training of physicians, dentists, nurses, and medical specialists and technicians, and the construction of hospitals and other community health facilities.

Provision is also made for the use of a part of such money at a later date as grants-in-aid for medical research, medical education, and the construction and operation of hospitals and other community health facilities.

Association Position.—The Association opposes this bill for the same reasons as for S. 337 (federal aid to medical education). It is the belief of the Association that under such a system an objectionable degree of federal control would be inevitable. The bill would create an opportunity for the exercise of political pressure and intervention and would jeopardize the academic freedom of medical schools.

RESOLUTIONS OF THE AMERICAN ASSOCIATION FOR HEALTH, PHYSICAL EDUCATION AND RECREATION

The American Association for Health, Physical Education and Recreation adopted a resolution commending the American Medical Association for calling, conducting, and reporting the Third Biennial National Conference on Physicians and Schools, which provided for an interchange of information regarding the patterns of school health programs in the various states and for an evaluation of progress made since the 1949 conference.

The association also commended the House of Delegates of the American Medical Association for revising a resolution concerning communism in schools, the original of which was phrased in such a way that it was misinterpreted as a broad indictment of America's schools. The House of Delegates expressed its confidence in the patriotism and Americanism of the vast majority of educators and of bona fide educational organizations.

Another resolution of the association commended the cooperative relationships that have existed between the American Medical Association and the National Education Association for 40 years through the Joint Committee on Health Problems in Education, which has initiated many of the advances in the school health programs through cooperative deliberations, committee action, and publications.

TWO NEW A. M. A. CONVENTION PROGRAMS

Registrants at the 101st annual meeting of the American Medical Association in Chicago, June 9-13, will receive two programs, one entitled "Program of the Scientific Assembly" and the other "General Program." Both will have new formats and attractively designed covers. The Scientific Assembly program contains detailed information on the general scientific meetings, 21 section meetings, scientific exhibits, motion pictures, and television shows. The new pocket-size general program carries a condensed program of the scientific meetings plus a list of technical and scientific exhibitors; social events, including luncheons, dinners, and meetings of fraternity, alumni, and other organizations; maps of the exhibit hall at Navy Pier and the convention area; officers of the A. M. A.; local committees; and special announcements.

POSTGRADUATE MEDICAL EDUCATION

Recognizing the need for increased service in the field of postgraduate education, the Council on Medical Education and Hospitals has been authorized by the Board of Trustees to secure a new staff member to direct A. M. A. activities in this area. Existing programs will be studied in order to establish Council-approved principles and standards for greater efficiency in working with state medical societies, medical schools, and other groups interested in furthering postgraduate medical education.

FEDERAL MEDICAL LEGISLATION

Special Pay for Military Physicians

Senator Hunt of Wyoming introduced S. 3019 to amend the Career Compensation Act of 1949 to extend the application of the special-inducement pay provided thereby to physicians and dentists. His bill proposes to extend for one year the $100 per month special pay of regular and reserve component officers of the armed forces and the Public Health Service. The expiration date of special pay in the present law is Sept. 1, 1952. Another provision of the bill would grant similar benefits to retired regular officers of the armed forces and Public Health Service who returned to active duty. Physicians and dentists inducted by Selective Service under the doctor draft act and subsequently commissioned would also receive the special pay under provisions of this bill.

Senator Douglas of Illinois introduced S. 3035, which would abolish special pay for physicians and dentists of the uniformed services. His bill would repeal a section of the Career Compensation Act of 1949 and several sections of the doctor draft act.

Defense Housing and Community Facilities

S. 3066 was introduced by Senator Maybank of South Carolina. This bill would amend the defense housing laws and, among other things, increase the present authorization of 60 million dollars for community facilities and services to 160 million dollars. Last year Congress voted 60 million dollars to be available until July 1, 1953, to assist communities in providing community facilities and services in crowded defense areas. A portion of the funds is authorized to be used for construction of hospitals and clinics.

Dental Division for VA

A bill to provide for efficient dental care for veterans entitled to receive dental benefits under laws administered by the Veterans Administration was introduced by Representative Allen of Louisiana as H. R. 7505. This bill would vest greater program authority in a chief dental director of the VA. Each hospital, regional office, and domiciliary institution manager would report to the chief dental director in matters pertaining to dental care. Dental budgets would be prepared and justified by the chief dental director. The office would consist of the chief, one deputy and no more than seven assistant medical directors. At the present time, the chief of the dental service is known as the assistant chief medical director, dental service. The chief dental director would remain responsible to the Administrator and to the chief medical director for the operation of this service.

Longshoremen's and Harbor Workers' Compensation Act Amendment

Representative Tollefson of Washington introduced H. R. 7517, which would amend the Longshoremen's and Harbor Workers' Compensation Act to increase the maximum benefits provided by this act and to extend its provisions to Puerto Rico. One provision of this bill would amend a section of this act that presently requires the employer to furnish medical and surgical care to injured workers. The amendment would permit the injured employee to select his own attending physician.

Social Security Amendments

Representative Kean of New Jersey introduced H. R. 7549, proposing to extend and improve the old-age and survivors insurance system to prevent loss of benefit rights in the event of disability and to provide for rehabilitation. The bill seeks to: (1) increase monthly benefits by approximately 10%; (2) extend coverage to approximately 5 million additional persons, including 3,500,000 agricultural operators, 450,000 agricultural workers, 500,000 professional persons (including physicians), 115,000 domestics, and several hundred thousand casual workers; and (3) provide rehabilitation services and insurance preservation rights for disabled persons.

The bill would remove the exclusion from coverage in the present law of such persons as physicians, lawyers, dentists, accountants, architects, engineers, and funeral directors.

Rehabilitation services presently available under the federal Vocational Rehabilitation Act, such as medical care, hospitalization, and appliances, would be rendered through state agencies to disabled persons who are expected to be disabled throughout a six-month waiting period or longer and to totally and permanently disabled persons, so that workers might be returned to gainful employment. The entire cost of such rehabilitation services would be borne by the Social Security Trust Fund. Presently, federal funds are being expended under the Vocational Rehabilitation Act at the rate of 21,500,000 dollars annually. During the period of disability, insurance rights for workers would be preserved, so that, in computing old age benefits later, the period of disability would not be included in determining an average monthly wage.

The Administrator of the Federal Security Agency would determine whether a claimant is permanently and totally disabled, or is likely to be, unless rehabilitated. The Administrator would arrange for medical examinations and reexaminations of disability claimants. Examinations would be performed in existing agencies of the federal government, if available, and by impartial private physicians, clinics, hospitals, or other medical facilities designated by the Administrator. The Administrator would be authorized to secure the cooperation of public agencies and private medical, dental, hospital, nursing, health, educational, social, and welfare groups for advice and service in carrying out the vocational rehabilitation and examination sections of the bill. No increase in payroll deduction for social security insurance is provided in the bill.

STATE MEDICAL LEGISLATION

New York

Bills Enacted.—A. 3046, has become Ch. 787 of the Laws of 1952. It amends the workmen's compensation law by authorizing injured employees to select to treat them any podiatrist authorized by the chairman of the industrial board to render podiatry care. S. 899, has become Ch. 673 of the Laws of 1952. It amends the mental hygiene law by providing that no person or association shall maintain an institution for the treatment of the mentally incompetent without first obtaining a license therefor. It also authorizes the director of such institutions, in the event of the death of a patient who has been maintained wholly at public expense to make or cause to be made by a member of the medical staff an autopsy on the body of such patient provided that it shall be made in such manner that will cause the least mutilation and provided also that there shall be printed conspicuously upon all application blanks used in admitting patients to the institution the fact that the officers of the institution have such a power in relation to making autopsies. S. 1123, has become Ch. 654 of the Laws of 1952. It authorizes the board of supervisors of a county at least 150 days prior to any general election and subject to a permissive referendum to abolish the office of coroner and create the office of medical examiner therein. S. 2005, has become Ch. 731 of the Laws of 1952. It provides regulations for the control of nurse's registries.

Virginia

Bill Enacted.—S. J. R. 27, was adopted Feb. 23, 1952. It directs the Virginia Advisory Legislative Council to make a study and report upon the feasibility of providing hospitalization and other types of medical care for public assistance recipients and to determine whether or not it is desirable to provide for the establishment of a prepayment pool operated by an agency of the state for such purpose.

The summary of federal legislation was prepared by the Washington Office of the American Medical Association and the summary of state legislation by the Bureau of Legal Medicine and Legislation.

MEDICAL NEWS

CALIFORNIA

Personal.—Dr. Anthony J. J. Rourke, physician superintendent of Stanford University Hospital, San Francisco, has been designated executive director of the Hospital Council of Greater New York and will take up his new duties on July 1.——Dr. Arthur L. Bloomfield, San Francisco, professor of medicine at Stanford University School of Medicine, delivered the George M. Kober Lecture in Washington, D. C., May 1, on "The Principle of Bacterial Infection in the Upper Air Passage."

Dr. Sweet Honored.—Dr. Clifford D. Sweet of Oakland, for 30 years chief of staff of Children's Hospital of the East Bay, will be honored by the medical staff on May 21-23 with the inauguration of the Clifford Sweet Clinics and Lectureship and the unveiling of a new portrait. The ceremonies will precede a three day schedule of clinical conferences, culminating with a public lecture on May 23 by Dr. Irvin McQuarrie, head of the department of pediatrics, University of Minnesota Medical School, Minneapolis. It is planned to make the Sweet Clinics and Lectureship an annual event.

Hospital Applications for Federal Funds.—Dr. Wilton L. Halverson of San Francisco, director of the California Department of Public Health, announces that applications for federal and state aid to build local hospital and health center facilities must be submitted to the department by May 31. Organizations planning to apply for construction funds may obtain application forms and advisory services from the department's Bureau of Hospitals. Both public agencies and voluntary nonprofit organizations are eligible to apply for federal funds to supplement local contributions; however, state funds in matching amounts are available only to tax supported agencies. Since the construction program began in 1947, California has received about $15,000,000 in federal and $9,000,000 in state appropriations. Forty-five hospital and 10 health center projects have shared in these grants to date. The hospitals, when all are completed, will provide 3,000 beds.

Dr. Evans Wins Passano Foundation Award.—Dr. Herbert McLean Evans of Berkeley has been named winner of the Passano Foundation Award for 1952. Dr. Evans is professor of anatomy at the University of California, Hertzian Professor of Biology, and director of the Institute of Experimental Biology. Among his contributions to medical knowledge are the introduction of Evans' blue, an azo dye, for estimation of blood volume; with J. A. Long, Ph.D., the first description of the estrus cycle in rats; separation of the pituitary growth promoting hormone; establishment of a criterion of vitamin A deficiency in continuous vaginal cornification; and discovery of vitamin E. Presentation of the $5,000 cash award will be made at a dinner for about 150 medical men and women at the Palmer House in Chicago on June 11. The principal address will be given by Dr. Louis H. Bauer, President-Elect of the American Medical Association, after which the award will be presented by Dr. George W. Corner, Baltimore, a member of the board of the foundation, who was closely associated with Dr. Evans in his work for years.

COLORADO

Annual Intern-Resident Clinics.—The annual Colorado Intern-Resident Clinics will be held June 4-5 at the University of Colorado Medical Center, 4200 E. Ninth Ave., Denver. The morning sessions will consist of clinical discussions. In the afternoons, papers reporting original investigations will be presented by members of the house staffs. The guest clinician will be Dr. Tinsley R. Harrison, professor of medicine at the Medical College of Alabama, Birmingham. His presentation on "Some Theoretical and Practical Applications of the Electrokymogram and the Ballistocardiogram" will be delivered on the evening of June 4. The program is open to all interested physicians.

FLORIDA

Seminar on Diagnosis.—On June 19-21 a seminar on diagnosis will be conducted at the George Washington Hotel in Jacksonville by Drs. Lewis M. Hurxthal, Hugh F. Hare, and William A. Meissner of the Lahey Clinic, Boston. Thursday will be devoted to a symposium on thyroid disease. On Friday there will be discussions on adrenal disease, lymph node disease, lung tumors, and metabolic bone disease. On Saturday there will be a clinicopathological conference with discussion of clinical and laboratory methods of diagnosis.

ILLINOIS

Personal.—Dr. Frederick Plotke, formerly venereal disease control officer in the Chicago public health department, has been named public health consultant to the Illinois Department of Public Welfare, a newly created post.——Dr. Daniel T. Cole, assistant superintendent of the Anna State Hospital, resigned on his 70th birthday recently, after serving the hospital for 20 years.

Anniversary of Peoria State Hospital.—The golden anniversary of the Peoria State Hospital was recently celebrated in an all day program, which combined a meeting of the Peoria Medical Society and postgraduate conference with special anniversary ceremonies. Mr. Leonard Belt, Illinois Department of Public Welfare executive assistant, presented an historical survey of the hospital's accomplishments since it opened in 1902. Dr. Henry B. Knowles, superintendent of the hospital, presided at the postgraduate conference meetings. Dr. Walter H. Baer, former superintendent, presided at the anniversary ceremonies.

Chicago

Dr. Sheinin Awarded Medal.—Dr. John J. Sheinin, president of the Chicago Medical School, has been chosen for the first Annual Gold Medal Award of Alpha Rho Chapter of Phi Lambda Kappa fraternity in recognition of his devotion to the development and progress of the school and to the general welfare of the student body. The presentation will be made by Sanford I. Cohen, president of the chapter, at the annual fraternity dinner-dance May 24, at the Furniture Club of America, 666 Lake Shore Dr.

Society News.—The Chicago Society of Physical Medicine and Rehabilitation will hold its scientific session at the University of Illinois, 1819 W. Polk St., May 28 at 8 p. m. Dr. Robert L. Bennett, director of the department of physical medicine, Georgia Warm Springs Foundation, will discuss "After-Effects of Acute Anterior Poliomyelitis as It Pertains to Physical Medicine and Rehabilitation." The society will meet for dinner at the Medical Center, Y. M. C. A., 1804 W. Congress St., at 6:30 p. m. Dinner charge is $3. Physicians and their guests are welcome.

INDIANA

Anesthesiology Seminar.—A seminar in anesthesiology, sponsored by the Indiana University School of Medicine and the Indiana State Society of Anesthesiologists, will be held May 21 in Indianapolis. Presentations will be made by Mr. John B. Dunne, Pittsburgh, on "Means of Artificial Respiration by Intermittent and Positive Pressure Methods," and Dr. John P. Graf, Indianapolis, on "Clinical Trial Drugs Being Investigated at the Indiana University Hospitals, Department of Anesthesiology."

Physicians are invited to send to this department items of news of general interest, for example, those relating to society activities, new hospitals, education and public health. Programs should be received at least three weeks before the date of meeting.

Annual Tumor Seminar.—An annual tumor seminar, sponsored by the Indiana Association of Pathologists and the Veterans' Administration Hospital, will be held May 25 in the new Veterans' Administration Hospital Auditorium in Indianapolis. A few slide sets are available for pathologists who plan to attend but who are not members of the state association. The proceedings will be distributed to those who register for the slide sets. A fee of $10 is charged for the slide sets and protocols. Requests should be sent to Dr. John L. Arbogast, Indiana University School of Medicine, Indianapolis.

Personal.—Rolla N. Harger, Ph.D., chairman of the departments of biochemistry and pharmacology at Indiana University School of Medicine, Indianapolis, was recently elected president of the American Academy of Forensic Sciences during the annual convention in Atlanta.——Dr. John L. Arbogast, Indianapolis, director of the clinical laboratories of the Indiana University Medical Center, was recently appointed chairman of postgraduate education for the North Central Group of the College of American Pathologists. He was also made secretary-treasurer of the Marion County Blood Banks, Inc.

MASSACHUSETTS

State Medical Meeting in Boston.—The annual meeting of the Massachusetts Medical Society will be held at the Hotel Statler, Boston, May 20-22, under the presidency of Dr. W. Richard Ohler of Boston. A cardiac symposium will be held from 2 to 5 p. m. Wednesday in the Georgian Room. Presentations by Drs. Benedict F. Massell, Dwight E. Harken, Herrman L. Blumgart, Lewis Dexter, J. Gordon Scannell, and Laurence B. Ellis, all of Boston, will be followed by a motion picture on "Coarctation of the Aorta," shown by courtesy of E. R. Squibb & Sons. On Thursday from 2 to 4:30 p. m. there will be a symposium on "Present Status of Recent Therapeutic Advances," followed by a motion picture dealing with injuries to the peripheral nerves. Collaborating in the symposium will be Drs. William B. Castle, Louis Weinstein, Fred H. Allen Jr., John Rock, George W. Thorn, and Chester S. Keefer, all of Boston. Dr. John W. Cline of San Francisco, President of the American Medical Association, will be guest speaker at the annual dinner at 7 p. m. on Wednesday. An exhibition of works of art by members of the Massachusetts Physicians Art Association will be open from 9 a. m. to 5 p. m. on the fourth floor of the Hotel Statler throughout the convention.

MINNESOTA

Personal.—The Minnesota [illegible] will give a dinner at the Edina Countr[illegible], May 26, to honor Dr. Leo G. Rigler, who has completed 25 years as head of the department of radiology, University of Minnesota Medical School, Minneapolis.

State Medical Meeting at Minneapolis.—The annual meeting of the Minnesota State Medical Association will be held at the Hotel Radisson in Minneapolis May 26-28 under the presidency of Dr. Roger L. J. Kennedy of Rochester. Obstetric manikin demonstrations will be given by Drs. Hugh G. Hamilton of Kansas City, Mo., and Leon S. McGoogan of Omaha on Monday and Tuesday, respectively. They will also lead round-table discussions on "The Induction of Labor" and "The Correlation of Clinical and X-Ray Pelvimetry." Other out-of-state speakers include:

Ross Golden, New York, Russell D. Carman Memorial Lecture, Clinical Aspects of Abnormal Small Intestinal Physiology.
Edith L. Potter, Chicago, Arthur H. Sanford Lectureship in Pathology, Practical Aspects of the Rh Factor.
Richard W. Te Linde, Baltimore, Carcinoma of the Cervix.
Chester M. Kurtz, Madison, Treatment of Convalescent Cardiac Cases.
John F. Fulton, New Haven, Rabelais and Modern Medicine.

The woman's auxiliary will hold its meetings simultaneously.

MISSOURI

Society News.—Dr. Park J. White of St. Louis will address an open meeting of the St. Louis Medical Society May 20, at 8:30 p. m., on "Accidents in Childhood: The Next Step in Preventive Pediatrics."

Thompson Lectureship.—The Thompson, Brumm and Knepper Clinic, St. Joseph, announces the third annual Dr. F. G. Thompson Sr. Lectureship. Dr. Willard O. Thompson, clinical professor of medicine, University of Illinois College of Medicine, Chicago, will present a paper on "Uses and Misuses of Sex Hormones," May 29 at 8 p. m. in the clinic building, 902 Edmond St., St. Joseph.

NEBRASKA

Muscular Dystrophy Associations.—The Nebraska Chapter of the Muscular Dystrophy Associations of America is interested in getting Nebraska physicians to serve on its medical advisory board. Although physicians in all parts of the state are needed, there is particular need for physicians from the Lincoln, Omaha, Grand Island, Scottsbluff, and Alliance areas. Those interested in serving in this capacity are requested to write to Miss Dorothea Ridder, Fairbury.

New Cerebral Palsy Unit.—Dr. John M. Thomas of Omaha, chief of service of the new cerebral palsy unit at the Nebraska Orthopedic Hospital in Lincoln, announces that the unit is now ready to consider applicants for admission. The purpose of the unit is "to provide medical and educational care for cerebral palsy patients" in Nebraska. This service includes education of the parents in home care and provides direction to the rehabilitation program of the patient. The program of the unit will augment the work already being done at the hospital in the care of these patients. In its early stages the unit will consist of 8 to 10 beds, with additional space for instruction and rehabilitation training. Dr. Howard E. Mitchell of Lincoln has been appointed assistant chief of service. Nebraska physicians wishing to have patients admitted are asked to write to Dr. Thomas in care of the unit in Lincoln for application blanks.

NEW HAMPSHIRE

Director Takes Position in Peru.—Frederick J. Vintineer, M.P.H., assistant state health officer and director of the Bureau of Occupational Health, Concord, has accepted the position of director of the industrial health section of a Peruvian national health program recently established by the Institute of Inter-American Affairs. He has been on the state department of health's staff more than 20 years.

NEW YORK

Society Election.—The Queens Pediatric Society in Forest Hills, L. I., has elected Dr. Samuel Dillon of Rockaway Park as president and Dr. Moe Goldstein of Forest Hills as secretary.

Personal.—Dr. Merel H. Harmel has been named head of the recently established department of anesthesiology at the State University of New York College of Medicine in New York City.——Dr. Karl M. Wilson, professor of obstetrics and gynecology, University of Rochester School of Medicine and Dentistry, who has been on the staff since the school opened in 1925, will retire at the end of the present academic year.——At a meeting of the Medical Board of the Jewish Hospital of Brooklyn on April 7 Dr. Samuel B. Schenck was elected president.

Lectures on Adult Heart Disease.—The University of Buffalo School of Medicine in cooperation with the Eighth District Branch, Medical Society of the State of New York, and the Western New York State Heart Association will present a course in "Major Problems in Adult Heart Disease for Practitioners," May 20-21. The visiting lecturer, Dr. Irving S. Wright, professor of clinical medicine, Cornell University Medical College, New York, and president-elect, American Heart Association, will discuss "Modern Management of Myocardial Infarction" on Wednesday, 3:15 to 4 p. m. in the main conference room of Edward J. Meyer Memorial Hospital.

New York City

Lecture on Multiple Personality.—Dr. John G. Lynn of Honolulu, Hawaii, has been invited to address the Association for the Advancement of Psychoanalysis on May 28 at the New York Academy of Medicine, 5th Ave. and 103rd St. His subject will be "Dynamics of Multiple Personality."

Symposium on Pericarditis.—The New York Society for Circulatory Diseases will meet at 8:30 p. m. June 5 at the Hotel Statler, New York. Guest speakers participating in a symposium on pericarditis will include:

Herbert Elias, New York, Mechanical Problems in Acute and Chronic Pericarditis.
William Hitzig, New York, Etiology and Treatment of Pericarditis.
Charles P. Bailey, Philadelphia, Surgical Treatment of Pericarditis and Surgical Pericarditis as a Treatment.
Otto H. Janton Jr., Philadelphia, Discussion of Medical Aspects.
Samuel A. Thompson, New York, Discussion of Surgical Aspects.

New Cancer Society Formed.—Formation of a new clinical society designated as the New York Cancer Society, Inc., was announced at a dinner meeting of the Founders' Group at the Yale Club of New York on March 28. With an initial membership of 36 specialists interested primarily in diagnosis and treatment of neoplastic diseases, the object of the society is to encourage research and to exchange information bearing on this subject. Dr. Frank Glenn was elected president; Dr. Gray H. Twombly, vice president; Dr. John J. Conley, secretary; and Dr. William Harris, treasurer.

Personal.—The Council of the New York Academy of Medicine announces the appointment of Dr. Robert L. Craig as secretary to the Committee on Medical Education of the New York Academy of Medicine, to fill the office heretofore held by Dr. Mahlon Ashford, who has retired.——Dr. Leonard J. Goldwater, professor of occupational medicine at Columbia University School of Public Health, has been appointed consultant on cardiac rehabilitation to the Federal Office of Vocational Rehabilitation.——Dr. Frank M. Frankfeldt was the guest of the Royal Society of Medicine at the annual meeting of its section on proctology in London, May 14. He spoke on "Endoscopic Removal of Polyps by Electrosurgery."

NORTH CAROLINA

Personal.—Dr. Watson S. Rankin of Charlotte delivered an address, dealing with the life of James Buchanan Duke (1856-1925), at the North Carolina Dinner of the Newcomen Society of England, held at Charlotte on April 4.

State Medical Meeting.—The annual session of the Medical Society of the State of North Carolina was held May 5-7 in Pinehurst under the presidency of Dr. Frederic C. Hubbard of North Wilkesboro. Dr. John W. Cline of San Francisco, President of the American Medical Association, addressed the first general session and spoke at the president's dinner. Other out-of-state speakers included Drs. Edward B. D. Neuhauser, Boston, and Charles E. Flowers Jr., Brooklyn.

OREGON

Society News.—The Southern Oregon Medical Society will hold its annual session at Roseburg's Veteran's Administration Hospital May 28, under the presidency of Dr. Alstrup N. Johnson of Roseburg. Papers will be presented on "Diagnosis and Treatment of Hypothyroidism," "Cryptorchidism and Delayed Adolescence," "Treatment of Menopause and Senile Osteoporosis and Ovarian Agenesis," "Problem of Menstrual Irregularities," and "Eunuchoidism and Male Climacteric."——At the annual meeting of the North Pacific Society of Neurology and Psychiatry in Portland, Dr. Gerhard B. Haugen of Portland was elected president; Dr. Gordon H. Hutton of Vancouver, B. C., president-elect; and Dr. Robert A. Coen of Portland, secretary-treasurer.

PENNSYLVANIA

Traveling Fellowship.—A fellowship of $1,000 to be contributed annually and to be known as the Dr. I. S. Ravdin Traveling Fellowship has been established in the University of Pennsylvania School of Medicine, Philadelphia, through a gift of Dr. Francis J. Halford of Honolulu, Hawaii. The first award will be bestowed in 1952 on a deserving young physician out of the surgical residency pool of the university hospital who wishes to improve his education through travel and additional studies elsewhere.

Philadelphia

Personal.—Dr. Alfred C. La Boccetta has been named acting medical director of Philadelphia General Hospital and acting chief of the bureau of hospitals of the Philadelphia Department of Health. He will continue to serve also as superintendent and medical director of the Hospital for Contagious Diseases.

Undergraduate Research Society.—The annual meeting of the Undergraduate Research Society of the Hahnemann Medical College will be held May 23 at Klahr Auditorium, 235 N. 15th St., Philadelphia. Original student papers will be presented from 2 to 4:30 p. m. The guest lecturer, Dr. Seymour S. Kety, associate director in charge of research, National Institutes of Mental Health and of Neurological Diseases and Blindness, will speak at 5 p. m. on "Consciousness and Cerebral Metabolism."

TENNESSEE

Clinic Receives Football Fund.—A check for $15,000, presented to the Vanderbilt Hospital's physical therapy department recently, represented the proceeds from last Thanksgiving's Clinic Bowl on Dudley Field, the football game between East and West high schools of Nashville. One result of this philanthropy can now be seen at the hospital, where about 800 sq. ft. of space is being added to physical, speech, and occupational therapy quarters.

Dr. Sanders Honored.—In honor of his 70th birthday, April 7, the April issue of the *American Surgeon* is dedicated to Dr. Robert Lee Sanders, professor of surgery at the University of Tennessee College of Medicine, Memphis, and past president of the Southeastern Surgical Congress. The dedication was made "as a token of appreciation of his unfailing interest in both the Southeastern and the Southwestern associations and in the journal throughout the years."

Scholarship for Students.—Chas. Pfizer & Company, Inc., of Brooklyn, manufacturers of pharmaceuticals, has awarded $1,000 to the University of Tennessee College of Medicine to establish a scholarship for medical students. To be eligible for participation, the student must be scholastically deserving and in need of financial aid. The fund will be administered by Orren W. Hyman, Ph.D., vice president of the university in charge of medical units and dean of the college of medicine.

TEXAS

Grant to Defray Costs of Postgraduate Courses.—The Texas Medical Association has given a grant of $2,500 to each of the three medical schools in Texas to help defray costs of postgraduate courses. The funds are to be used for expenses of visiting speakers and for announcements and clerical costs.

Personal.—Dr. Gladys J. Fashena, professor of pediatrics, Southwestern Medical School of the University of Texas, Dallas, has been appointed to the board of governors of Playtex Research Institute, Dover, Del.——Dr. Gilbert B. Forbes, professor of pediatrics, Southwestern Medical School of the University of Texas, was guest speaker at the meeting of the Tennessee State Pediatric Society at Knoxville on April 7-8.

Dr. Pullen Appointed Dean.—Dr. Roscoe L. Pullen, director of graduate medicine and vice-dean at Tulane University of Louisiana School of Medicine, New Orleans, has resigned to become dean and professor of medicine at the University of Texas Postgraduate School of Medicine in Houston, effective June 1. Dr. Pullen will succeed Dr. Mavis P. Kelsey, who has served as acting dean of the Texas school since Dr. Jack R. Ewalt left the post in November to become commissioner of mental health for the state of Massachusetts.

WASHINGTON

Course in Cardiology.—The University of Washington School of Medicine offers a course in "Recent Advances in Cardiology" June 16-17. The course, planned for general practitioners, surgeons, pediatricians, internists, and public health officers, will be limited to about 50 and will consist of illustrated lectures, clinical conferences, and panel discussions. Dr. David A. Rytand, associate professor of medicine, Stanford University, San Francisco, will be the guest lecturer. On Monday at 10:45 he will speak on "Practical Points on the Auscultation of the Heart," on Tuesday at 11:30 on "Current Views Regarding the Use and Actions of Digitalis," and at 2:45 on "New Treatments for Old Problems, or the Overtreatment of Heart Disease." On Monday two motion pictures will be shown: "Normal Development of the Mammalian Heart" and "Chest Fluoroscopy." On Tuesday afternoon there will be a panel discussion on "Management of Thromboembolism." The course is sponsored by the University of Washington School of Medicine, Washington State Medical Association, Washington State Department of Health, and Washington State Heart Association. The tuition fee is $20. Application should be sent to the Division of Postgraduate Medical Education, University of Washington School of Medicine, Harborview Hospital Annex, 9th and Jefferson, Seattle 4.

WEST VIRGINIA

Obstetrical Lectures.—The second of a series of three meetings arranged by the committee on medical education of the West Virginia State Medical Association will be held at the White Oak Country Club in Oak Hill, May 22. The meeting, which will be a one day graduate course in obstetrics, is being held in cooperation with the West Virginia University School of Medicine. Out-of-state speakers are as follows:

John L. Parks, Washington, D. C., Obstetric Analgesia.
John M. Nokes, Charlottesville, Va., Cardiovascular Diseases Associated with Pregnancy.
Alan F. Guttmacher, Baltimore, Pregnancy Control.
Morris E. Davis, Chicago, Management of the Placental Stage and Postpartum Hemorrhage.

GENERAL

Ophthalmological Meeting.—The American Ophthalmological Society will hold its annual meeting at the Homestead, Hot Springs, Va., June 5-7, under the presidency of Dr. Lawrence T. Post of St. Louis. Twenty-two papers will be presented.

Fellowship Awarded.—Dr. David Birnbaum of the department of internal medicine, Hadassah-University Hospital in Israel, has been awarded the Magnus-Warburg Fellowship from the Hebrew University for study and research in this country. Dr. Birnbaum is spending the year investigating the physiology of pancreatic secretion, in the Gastroenterology Research Laboratory of Mount Sinai Hospital, New York, under the direction of Franklin Hollander, Ph.D.

Annual Meeting on Investigative Dermatology.—The Society for Investigative Dermatology will hold its annual meeting at the Hotel Sherman, Chicago, June 7-8, under the presidency of Dr. Samuel M. Peck of New York. Thirty-four papers will be presented and one read by title. Reservations for the cocktail party and dinner, which will be held at 7 p. m. Saturday, should be made through Dr. Herman Beerman, 255 S. 17th St., Philadelphia 3; the price is $8 per person.

Angiology Meeting.—The North American Chapter of the International Society of Angiology will meet at the Conrad Hilton Hotel (formerly the Stevens) in Chicago June 7, under the presidency of Dr. Emile F. Holman, San Francisco. During the morning session there will be a panel discussion on "Management of Thromboembolism," with Dr. Alton Ochsner, New Orleans, as moderator. Collaborators will be Drs. Geza de-Takats, Chicago, Robert R. Linton, Boston, and Leo Loewe, New York. Information may be obtained from Dr. Henry Haimovici, Secretary, 105 E. 90th St., New York 28.

Academy of Sciences.—The National Academy of Sciences at its annual meeting held in Washington, April 28-30, reelected William J. Robbins, Ph.D., director of the New York Botanical Garden, as treasurer for another four year term. Other officers of the academy include: Detlev W. Bronk, Ph.D., Baltimore, president; Edwin B. Wilson, Ph.D., Brookline, Mass., vice-president; F. Alexander Wetmore, Ph.D., home secretary; and Roger Adams, Ph.D., foreign secretary. Dr. Robert F. Loeb, professor of medicine, Columbia University College of Physicians and Surgeons, New York, and Wendell M. Stanley, Ph.D., chairman of the department of biochemistry, University of California, Berkeley, were elected to membership on the council of the academy to serve until June 30, 1955.

Tuberculosis Symposium.—A tuberculosis symposium for general practitioners will be held in Saranac Lake, N. Y., from July 14-18. This symposium, sponsored by the Saranac Lake Medical Society, is approved for formal credit by the American Academy of General Practice. Seminars will be held on differential diagnosis, routine management and periodic evaluation of progress, streptomycin and *p*-aminosalicylic acid, other antimicrobial drugs and hormonal agents, collapse procedures, and resection of lung tissue. The symposium will be held during the mornings only, and there will be elective activities during the afternoon. The only charge for the symposium will be a $15 registration fee. Information can be obtained by writing the Saranac Lake Medical Society, Box 707, Saranac Lake, N. Y.

Traffic Deaths.—The National Safety Council on April 30 released statistics showing that traffic deaths in March, 1952, totaled 2,700—virtually the same number as in March, 1951. The toll for the first quarter of the year was 7,930, which was 2% greater than the total for the first quarter of 1951 and 11% above the 1950 toll for the same period. There were 323 cities with no traffic deaths in March. The three largest and their populations were: Rochester, N. Y., 332,500; Omaha, 251,100; and Richmond, Va., 230,300. For the first quarter of the year, 148 of the 451 cities had fewer deaths, 131 had more deaths, and 172 reported no change. For this period, 212 cities still had perfect records. The three largest were: Des Moines, Ia., 178,000; Cambridge, Mass., 120,700; and Elizabeth, N. J., 112,800.

American-Swiss Foundation for Scientific Exchange.—At the end of its sixth year, this foundation announces that 22 senior American scientists have been sent to Switzerland and 33 Swiss scientists have visited this country. The visitors included four Nobel prize winners (Harold C. Urey, D.Sc., Chicago; Edwin J. Cohn, Ph.D., Cambridge, Mass.; Prof. Leopold Ruzicka, Zurich, and Prof. Tadeus Reichstein, Basel, Switzerland). Furthermore, 71 postgraduate students were exchanged, in most cases for one year's residence. For the exchange of a total of 126 scientists $117,000 was spent, all donations having come from private sources. At the recent annual assembly, Dr. Caesar R. Scholz, Summit, N. J., was reelected president. The founder of the organization, Heinz M. Wuest, Ph.D., Montclair, N. J., is honorary president.

Proctologists to Hold Annual Meeting.—The annual meeting of the American Proctologic Society will be held at the Hotel Schroeder in Milwaukee June 4-7 under the presidency of Dr. Robert A. Scarborough of San Francisco. Guest speakers will include:

Herbert E. Schmitz, Chicago, Bowel Complications of Pelvic Malignancy and Endometriosis.
Armand J. Quick, Milwaukee, The Problem of Defective Hemostasis in Surgery.
Lowrain E. McCrea, Philadelphia, New Concept of Vesical Innervation and its Relationship to Abdominoperineal Proctosigmoidectomy.
Fred J. Hofmeister, Milwaukee, Reconstructive Perineal Repair of Rectovaginal Fistulas and Injuries Occurring at Parturition.

A symposium on "The Proctologic Aspects of Obstetric and Gynecologic Conditions" will be given by Drs. Schmitz and Hofmeister and by Drs. Herbert I. Kallet of Detroit and Charles E. Pope of Evanston, Ill.

New England Health Institute.—The institute sessions, to be held at the University of Connecticut, Storrs, June 18-20, will focus on "New Efforts for Health Improvement." On Wednesday at 11:30 a. m. there will be a panel discussion on "Fluoridation of Public Water Supplies." The views of the dentist, the sanitary engineer, and the biochemist will be given by Frank E. Law, D.D.S., Charles R. Cox, Albany, N. Y., and Harold C. Hodge, Ph.D., Rochester, N. Y., respectively. On Friday morning a "Town Meeting for Health" will be held with Mr. Carter W. Atkins as moderator of discussions on "Citizens' Responsibility Toward Public Health," "What Do We Have to Do?" and "How Can We Do It?" Room reservations may be made through Mr. Carlson E. Carne, Box U-56, University of Connecticut, Storrs, Conn., before May 31. Reservations for the banquet to be held Thursday evening must be made before June 15; the price of the banquet is $2.75.

DEATHS

Brown, Samuel Albertus ⊕ New York; born in Newark, N. J., Jan. 7, 1874; University of the City of New York Medical Department, New York, 1894; dean from 1915 to 1932, when he became dean emeritus and member of the council, and a member of the faculty from 1896 to 1932 of New York University and Bellevue Hospital Medical College, now known as the New York University College of Medicine; received the New York University Alumni Meritorious Service Award in 1932; his service to the college was commemorated also by establishment of the Samuel A. Brown chair of therapeutics; as chairman of the council committee on medicine and dentistry, aided in the development of plans for the New York University-Bellevue Medical Center and became vice-chairman of the board of trustees; specialist certified by the American Board of Internal Medicine; fellow of the American College of Physicians; past president of the New York Academy of Medicine; president of the New York University College of Medicine Alumni Association, 1923-1924; member of the New York Academy of Sciences, the Sons of the American Revolution, Harvey Society, and the New York Society of Military and Naval Officers; a member of the board of directors at Doctors Hospital and consultant for the New York Society for the Relief of the Ruptured and Crippled; consulting physician, Fitkin Memorial Hospital, Neptune, N. J., Monmouth Memorial Hospital, Long Branch, N. J., North Hudson Hospital, Weehawken, N. J., and Willard Parker, Bellevue, and French hospitals; served as a lieutenant colonel of the U. S. Army Medical Corps Reserve; received the honorary doctor of public health degree from New York University in 1926; died in Pompano, Fla., March 16, aged 78, of coronary occlusion.

Judy, Arthur Sinclair ⊕ Medical Director, Captain, U. S. Navy, retired, Los Angeles; born in Los Angeles, June 29, 1893; College of Physicians and Surgeons, Los Angeles, 1917; served an internship at the Los Angeles County Hospital; entered the U. S. Naval Reserve as a lieutenant (jg) in the medical corps in 1917; in 1918 transferred to the medical corps of the regular Navy; from 1919 to 1922, served aboard the USS Albany, then attached to the Asiatic fleet; and from 1926 to 1929 with the Garde d'Haiti at Port au Prince, Haiti; served as head of the medical and cardiac service at various naval hospitals; while serving as chief of the cardiac service at the Naval Hospital, Philadelphia, 1935-1937, was also a member of the cardiac clinic, Philadelphia General Hospital; in 1941-1942 was commanding officer of the Navy Mobile Hospital number 1 in New York; executive officer, Hospital Corps School, Great Lakes, Ill., 1942-1943; ordered to the Naval War College, Newport, R. I., for a course of instruction and then to the U. S. Naval Base Hospital number 3 in the South Pacific where he served as commanding officer for two years; served in the Washington, D. C., area on three occasions: Naval Medical School in 1922, U. S. Naval Dispensary in 1929, and the Navy Department in 1946; retired on May 1, 1948; for his World War II services at Base Hospital number 3 was awarded the Bronze Star Medal; received the Distinguished Service Medal from the Republic of Haiti for services while serving with the Garde d'Haiti, Port au Prince; awarded the World War I Victory Medal, American Defense Service Medal, Asiatic Pacific Campaign Medal, and the World War II Victory Medal; specialist certified by the American Board of Internal Medicine; died in the California Hospital Jan. 4, aged 58, of pneumonia.

Faris, James Edge ⊕ Medical Director, U. S. Public Health Service, Fort Monroe, Va.; born in Red Hill, Va., Aug. 1, 1889; University of Virginia Department of Medicine, Charlottesville, 1916; commissioned an assistant surgeon in the U. S. Public Health Service in 1917; became a surgeon in 1925, senior surgeon in 1937, and medical director in 1943; engaged in antityphus work in Boston and was an immigration examiner in Montreal, Canada; in 1922 student officer at the Hygienic Laboratory in Washington, D. C.; executive officer, Marine Hospital, Ellis Island, 1922-1923; chief quarantine officer, Virgin Islands, 1923-1925; medical adviser to the American Consul, Gothenburg, Sweden, 1926-1928, and to the American Consul General, Genoa, Italy, 1928-1931; hospital administrator to the U. S. Indian Service, Washington, D. C., 1931-1935; medical officer in charge of the Marine Hospital in Mobile, Ala., 1935-1936, with the Alabama State Health Department in Montgomery, 1936-1937, and the Nebraska State Health Department, 1937-1938; medical officer in charge of the U. S. Quarantine Station, Fort Monroe, since September, 1938; died Jan. 20, aged 62, of coronary occlusion.

Brumm, Seth Arthur ⊕ Philadelphia; born in Minersville, Pa., Feb. 27, 1882; University of Pennsylvania Department of Medicine, Philadelphia, 1906; specialist certified by the American Board of Otolaryngology; member of the American Academy of Ophthalmology and Otolaryngology and the American Laryngological, Rhinological and Otological Society; past president of the Philadelphia County Medical Society, which in 1936 presented him with the 13th Dr. I. P. Strittmatter Award "in recognition of his accomplishments in the activities of organized medicine"; appointed chief of the division of communicable diseases of the Philadelphia Department of Public Health in 1932 and in the same year elected president of the Philadelphia Association of Tuberculosis Clinics; served during World War I; formerly affiliated with St. Luke's and Presbyterian hospitals; died in Pottsville, Pa., Feb. 21, aged 69.

Casey, John Francis ⊕ Boston; born in Groton, Conn., in 1885; Columbia University College of Physicians and Surgeons, New York, 1909; past president (three terms) of the Middlesex South District Medical Society; councilor of the Massachusetts Medical Society; member of the American Heart Association, New England Diabetes Association, and the American Association for the Advancement of Science; member of the Massachusetts Examining Physicians Society; medical director of the Civilian Defense and of the Red Cross for Brighton and Allston during World War II and member of the Procurement and Assignment Board of Physicians; past president of St. Luke's Guild; formerly chief of medical service at St. Elizabeth's Hospital; consulting physician, Whidden Memorial Hospital in Everett, Mass., and Leonard Morse Hospital in Natick, Mass.; died March 5, aged 66, of myocarditis.

Guion, Edward ⊕ Pleasantville, N. J.; born in Yonkers, N. Y., July 21, 1873; Medico-Chirurgical College of Philadelphia, 1899; member of the House of Delegates of the American Medical Association in 1912, 1914, 1916, 1917, and 1919; member of the American Psychiatric Association, Association for Research of Nervous and Mental Diseases, and the American Public Health Association; served during World War I; formerly practiced in Atlantic City, where he was president of the Atlantic County Medical Society; first health officer for many years and on the staff of the Atlantic City Hospital; for many years affiliated with Atlantic County Hospital for Mental Diseases in Northfield and Shore Memorial Hospital in Somers Point; died Feb. 21, aged 78, of acute coronary occlusion.

Cohen, Louis ⊕ Philadelphia; born in Philadelphia June 17, 1899; University of Pennsylvania School of Medicine, Philadelphia, 1923; clinical professor of medicine at Temple University School of Medicine; member of the American College of Chest Physicians and the American Trudeau Society; senior clinical physician, division of tuberculosis, city health department; chief visiting physician for the tuberculosis department of the Philadelphia General Hospital and the Philadelphia Hospital for Contagious Diseases; chief of the chest department at Montgomery Hospital in Norristown, and chief of the pneumothorax clinic in Norristown for the state; medical director of Eagleville (Pa.) Sanatorium for Consumptives; died Feb. 23, aged 52, of cerebral hemorrhage.

⊕ Indicates Fellow of the American Medical Association.

Burrows, Frederick Nelson, Bathgate, N. D.; McGill University Faculty of Medicine, Montreal, Canada, 1885; member of the American Medical Association; first president of the North Dakota State Board of Medical Examiners; died in Grand Forks Feb. 20, aged 96, following a hip fracture received in a fall.

Button, Meade A., Overland, Mo.; St. Louis College of Physicians and Surgeons, 1910; died in the Veterans Administration Hospital, Jefferson Barracks, March 6, aged 66, of coronary thrombosis.

Carlyle, John Bethune, Burlington, N. C.; Jefferson Medical College of Philadelphia, 1926; member of the American Medical Association; died Dec. 1, aged 50, of intracranial hemorrhage and hypertension.

Carson, Simeon Clark, Washington, D. C.; Howard University College of Medicine, Washington, 1933; died March 4, aged 44, of virus pneumonia.

Chastain, Walter C., Ellijay, Ga.; Hospital Medical College, Eclectic, Atlanta, 1911; died Dec. 10, aged 67, of cirrhosis of the liver.

Chopin, George F., St. Louis; Missouri Medical College, St. Louis, 1896; member of the American Medical Association; affiliated with De Paul Hospital, where he died Feb. 27, aged 77, of heart disease.

Clark, Philip Johnston, Hays, Kan.; University of Chicago School of Medicine, 1940; member of the American Medical Association; specialist certified by the American Board of Surgery; certified by the National Board of Medical Examiners; served in the South Pacific during World War II; resident in surgery from 1946 to 1949 at the University of Kansas Medical Center, Kansas City, Kan., where he died March 23, aged 36, of leukemia.

Clarke, Harry Carver ⊕ Lynn, Mass.; Harvard Medical School, Boston, 1910; affiliated with Union and Lynn hospitals; died Feb. 21, aged 73, of coronary disease.

Cochran, Arthur Conley, Atlanta, Ga.; Meharry Medical College, Nashville, Tenn., 1915; died Dec. 17, aged 65, of lobar pneumonia and a cerebral vascular accident.

Cooley, Elias Earle ⊕ Colonel, U. S. Army, retired, Greenville, S. C.; Jefferson Medical College of Philadelphia, 1912; entered the medical corps of the U. S. Army as a first lieutenant in December, 1917, rose through the various grades, and retired as a colonel in October, 1945; specialist certified by the American Board of Internal Medicine; fellow of the American College of Physicians; at one time assistant professor of military science at Johns Hopkins University School of Medicine, Baltimore; died in Greenville General Hospital Feb. 18, aged 62.

Dunham, Alonzo Hathaway, Dayton, Ohio; Jefferson Medical College of Philadelphia, 1899; past president of the Dayton Obstetrical and Gynecological Society; served on the staff of the Miami Valley Hospital; died Feb. 16, aged 77, of heart block following a prostatectomy.

Ehrhart, Lawrence Albert, Allison Park, Pa.; University of Pittsburgh School of Medicine, 1943; served during World War II; died in Veterans Administration Hospital, Aspinwall, Jan. 20, aged 35, of brain tumor.

Faletti, Anthony John, Miami, Fla.; University of Illinois College of Medicine, Chicago, 1928; member of the Illinois State Medical Society, and American Medical Association; served during World War II; died in Coral Gables Jan. 4, aged 50, of intestinal obstruction and adenocarcinoma of the ascending colon.

Firestone, Charles, Seattle; New York University and Bellevue Hospital Medical College, New York, 1922; member of the American Medical Association and the American Academy of Ophthalmology and Otolaryngology; specialist certified by the American Board of Otolaryngology; physician for U. S. government hospitals in Alaska from 1923 to 1929; served during World War II; on the staff of Columbus Hospital; died Jan. 18, aged 54, of hypertension and acute coronary infarction.

Fleeger, Abram Boyd, Willow Lake, S. D.; Washington University School of Medicine, St. Louis, 1901; died in St. John's Hospital, Huron, Dec. 29, aged 81, of uremia and myocarditis.

Gedert, John Joseph, Clyde, Ohio; St. Louis University School of Medicine, 1922; member of the American Medical Association; served during World War I; died in American Hospital, Chicago, March 28, aged 55, of bronchopneumonia and carcinoma of the stomach and esophagus.

Godbold, John Cooper ⊕ Whatley, Ala.; University of Alabama School of Medicine, Mobile, 1911; died in Grove Hill Jan. 30, aged 63, of cardiorenal disease and hemorrhage of the stomach.

Going, Robert, Calhoun City, Miss.; Memphis (Tenn.) Hospital Medical College, 1908; died Dec. 26, aged 76, of coronary thrombosis.

Gould, Isaac Lawrence ⊕ Des Moines, Iowa; State University of Iowa College of Medicine, Iowa City, 1919; served during World War I; affiliated with Veterans Administration Center, where he died Jan. 3, aged 58, of coronary occlusion.

Guthrie, Ewing S., Denver; St. Louis College of Physicians and Surgeons, 1888; member of the American Medical Association; served on the staff of St. Luke's Hospital; died Feb. 10, aged 89.

Hall, Thomas M., Milledgeville, Ga.; Southern Medical College, Atlanta, 1893; member of the American Medical Association; died Jan. 30, aged 80, of cerebral hemorrhage and hypertension.

Hanby, Elmus Knowles, Attalla, Ala.; Birmingham Medical College, 1902; member of the American Medical Association; died in Gadsden Jan. 29, aged 71, of coronary thrombosis and arteriosclerosis.

Harrell, Augustus O., Milan, Ga.; Emory University (Ga.) School of Medicine, 1918; member of the American Medical Association; died in Eastman (Ga.) Hospital Feb. 17, aged 71, of cerebral hemorrhage.

Harrop, Joseph Kester, West Warwick, R. I.; Hahnemann Medical College and Hospital of Philadelphia, 1941; member of the American Medical Association; served overseas during World War II; affiliated with Roger Williams General Hospital in Providence, and the Kent County Memorial Hospital in Warwick, where he died Jan. 27, aged 36, of cerebral hemorrhage and hypertension.

Hill, Anthony John, Philadelphia; Jefferson Medical College of Philadelphia, 1896; died in Dufur Hospital, Ambler, Pa., March 22, aged 79.

Holland, Homer Jay, Mukwonago, Wis.; University of Wisconsin Medical School, Madison, 1943; member of the American Medical Association; served in the Pacific theater during World War II; died recently, aged 33.

Howland, Edward De Monte ⊕ Chicago; Rush Medical College, Chicago, 1886; an Associate Fellow of the American Medical Association; fellow of the American College of Surgeons; served on the staff of the Illinois Masonic Hospital; died March 27, aged 93, of bronchopneumonia, carcinoma of the rectum, and arteriosclerosis.

Howlett, Howard Henry ⊕ Silver Spring, Md.; George Washington University School of Medicine, Washington, D. C., 1907; died Jan. 19, aged 68, of coronary heart disease.

Jamison, David Kincaid ⊕ Denison, Texas; University of Texas School of Medicine, Galveston, 1910; on the staff of the Madonna Hospital; surgeon for the Missouri-Kansas-Texas Railway Company; died recently, aged 65, of diabetes mellitus and uremia.

Kafer, Oscar Adolph ⊕ New Bern, N. C.; University of Maryland School of Medicine, Baltimore, 1934; died Dec. 29, aged 43, of angina pectoris and myocarditis.

Kato, Hideo Henle, Ogden, Utah; University of Louisville (Ky.) School of Medicine, 1941; member of the American Medical Association; was decorated with three battle stars during World War II; consulting psychiatrist, Utah State Training School in American Fork; died March 26, aged 37, of uremia.

Kelsey, James Henry, Cassopolis, Mich.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1901; served during World War I; formerly mayor, county physician, and Cass county coroner; died in Memorial Hospital, St. Joseph, Feb. 29, aged 73, of cerebral vascular accident.

GOVERNMENT SERVICES

NAVY

Course in Radioactivity.—A course of instruction in the medical aspects of special weapons and radioactive isotopes will be held at the Naval Medical School, National Naval Medical Center, Bethesda, Md., May 19-24. This course is primarily for inactive reserve medical officers but a limited number of officers on active duty may attend. The problems likely to confront medical and dental officers in the field of radioactivity and techniques employed to counteract these problems will be discussed.

Inactive reserve medical department officers who reside in the 1st, 3rd, 4th, 5th, 6th, 8th, and 9th Naval Districts and the Potomac River Naval Command may request active duty orders to attend this course of instruction from their respective District Commandant. Acceptance of orders to attend this course of instruction will not, according to the Surgeon General of the Navy, in any way increase the possibility of the officer's being involuntarily recalled to active duty.

Captain Lane, MC, retires.—Captain Charles W. Lane, MC, director of the Naval Reserve Division, Navy's Bureau of Medicine and Surgery, Washington, D. C., was placed on the retired list on May 1 after having served more than 34 years active and inactive service, over 20 years of which have been on active duty. Entering the Naval Reserve Forces as an assistant surgeon in 1917, he served with the Marines in the Virgin Islands during World War I. In 1918, he transferred to the regular Navy. In 1927 he resigned and immediately reentered the Naval Reserve on an inactive status. From 1927-1941, Dr. Lane specialized in surgery and diagnosis in San Diego, California. He was recalled to active duty in 1941. Captain and Mrs. Lane will return to California and take up residence in their permanent home at Great Oaks, Descanso.

Bronze Star to Captain Coyl.—Capt. Edwin B. Coyl (MC) was awarded the Bronze Star Medal for meritorious achievement in connection with operations against the enemy in Korea. As officer in command of the Naval Hospital on board the USS Repose, he displayed exceptionally meritorious conduct in the performance of outstanding services. Captain Coyl also displayed outstanding ability in coordinating the various activities of his command to attain the maximum efficiency of operations. During the period from September, 1950, to July, 1951, a total of 8,146 patients were admitted to the hospital and 1,231 were evacuated to Japan. By his varied abilities and untiring efforts, Captain Coyl contributed directly to the high morale of the wounded and consequently to the success of the friendly allied forces in Korea.

Society News.—The monthly meeting of the Medical Association of the Isthmian Canal Zone was attended by 50 civilian and military physicians on April 15, 1952, at the Naval Hospital, Coco Solo, Canal Zone. Col. N. W. Elton (MC) of Gorgas Hospital, presided. Physicians from the Gorgas Hospital, Colon Hospital, Amador Guerrera Hospital (Panamanian), and the Army Hospital, Fort Clayton, in addition to members of the Naval Hospital Staff attended the meeting. Members of the naval hospital staff presented the following program:

Multiple Congenital Anomalies by Lieut. E. G. McKay (MC), USN. Comdr. B. W. Clark (MC), USN, discussed surgery in the case presented.

Plastic Repair of the Relaxed Abdominal Wall by Lieut. Comdr. J. A. Pease (MC), USN.

Five-Year Results in Malignant Melanomas (with lantern slides) by Lieut. (jg) J. J. Humes (MC), USN.

Personal.—Rear Adm. Lamont Pugh, the Surgeon General, lectured on "Oral Medicine" before the student body and faculty of Jefferson Medical College, Philadelphia, on April 29.——Capt. John T. Smith, MC, director, dispensary medicine division and head of the physical qualifications branch, Aviation Medicine Division, has been ordered to duty as executive officer, Naval School of Aviation Medicine, Pensacola, Fla. He will be relieved by Commander Ross B. Lautzenheiser, MC, who recently reported to the Bureau of Medicine and Surgery from the staff, Commander Naval Forces, Eastern Atlantic.——Rear Adm. B. Groesbeck Jr., assumed command of the National Naval Medical Center, Bethesda, Md., April 30, relieving Rear Adm. W. J. C. Agnew.——Dr. Baldwin Lucke, chairman, department of pathology, University of Pennsylvania School of Medicine, Philadelphia, presented the seventh in the series of Naval Medical School Guest Lectures at the Naval Medical Center, Bethesda, Md., April 25, on "The Pathology of Viral Hepatitis in Man and Birds."

VETERANS ADMINISTRATION

Veterans of the Korean Conflict.—The Veterans Administration announces that at the end of January a total of 2,075 veterans of the Korean conflict were being hospitalized by the VA. A total of 6,830 veterans of the Korean conflict were drawing either VA disability compensation or pensions at the end of February.

The VA load of death claims stemming mainly from the Korean conflict also is increasing. At the end of February, the dependents of 10,388 such deceased veterans were drawing death compensation or pensions from VA. Approved indemnity claims, up to $10,000 each, for deaths in service or as a result of service since the Korean conflict started totaled 5,975 to the end of February. The estimated number of living veterans in civil life who had served in the Armed Forces since the Korean conflict started was 716,000. The estimated total of all veterans in civil life was 19,179,000, the great majority of whom served in World War II and prior wars. Many of the 716,000 veterans who have served since the Korean conflict began also served during World War II.

Emergency Repairs to Veterans' Braces.—More than 30,000 disabled veterans who have to wear orthopedic braces because of disabilities suffered in service may now get emergency repairs to those braces without prior Veterans Administration approval. VA Regional Offices have begun to issue a "Prosthetic Service Card—Orthopedic Braces" to each eligible veteran entitling him to this new service. By using this card, a veteran will get prompt service from commercial concerns or the Veterans Administration when he needs emergency or major repairs to his brace. The veteran, on presentation of the prosthetic service card at any commercial brace or repair shop, may receive emergency repairs up to $15 for each brace.

The card will also establish on-the-spot eligibility for major repairs or emergency replacement of orthopedic braces at any of the 30 VA orthopedic shops located throughout the country. Heretofore, veterans had to obtain prior approval from VA before emergency repairs to braces could be authorized. Amputee veterans already are receiving this type of emergency repair service for prosthetic arms and legs from commercial concerns.

New Hospital Managers.—Dr. George F. Swanson, manager of the VA hospital at Beckley, W. Va., has been named as manager of the new general medical and surgical hospital at Philadelphia, which is scheduled for completion in July, 1952. Dr. Roland W. Hipsley, chief of surgery at the hospital at Minot, N. D., has been promoted to manager of that hospital, succeeding Dr. John B. McHugh, who has been transferred to the position of manager of the new Kansas City, Mo., VA hospital.

Residencies Available.—Residencies are available at the new Veterans Administration Hospital at Albany, N. Y., in internal medicine, surgery, and neuropsychiatry. Physicians interested should write to Dr. Thomas Hale, Chairman, Deans Committee, Albany Medical College, Albany 1, N. Y., or to Dr. William Bean, Veterans Administration Hospital, Albany 1, N. Y.

FOREIGN LETTERS

COLOMBIA

Sanitary Campaigns.—Dr. Fred L. Soper, director of the Pan American Sanitary Bureau and regional head of the World Health Organization (WHO), recently visited Colombia, to organize the campaigns against malaria and yellow fever that are to be carried out by the above institutions in collaboration with the government of Colombia. Dr. Soper was accompanied by the following physicians: Dr. José Oswaldo da Silva, the head of the fourth zone of the Pan American Sanitary Organization, which includes Bolivia, Brazil, Colombia, Ecuador, Perú, and Venezuela; Dr. Enrique Azevedo, head of the yellow fever laboratory of the Instituto Oswaldo Cruz of Río de Janeiro; and Dr. Ernesto Miranda, in charge of the campaign for the control of the Anopheles mosquito in Puerto Rico. The Pan American Sanitary Bureau is interested in carrying out the following three projects in Colombia: (1) vaccination against diphtheria and whooping cough, in collaboration with the International Children's Emergency Fund (UNICEF); (2) a campaign against malaria and control of Aedes aegypti, in collaboration with the UNICEF, the World Health Organization, and the Inter-American Cooperative Department of Public Health; and (3) orientation of certain courses of medical teaching, which began by offering courses for obstetric nurses in the Escuela Superior de Higiene.

In the development of the 1952 campaign against malaria, 2,200,000 Colombian pesos will be spent, including 1,000,000 Colombian pesos, which is to be given by the government of Colombia; the rest of the money will be given by international organizations. To carry out the campaign systematically, the country will be divided into five zones. The center of the campaign will be the section of malariology of the Ministry of Hygiene. It will include, during this year, the Caribbean Sea zone (departments of the Atlantic, Bolivar, Magdalene, Antioquia, northern regions of Santander, and the Guajira commissariat). This first program covers an area of 116,950 sq. km., with 1,912,620 persons and 361,541 houses. The 288,609 houses that are located in malaria zones will be sprayed with DDT. Although this zone is not greatly affected by malaria, it is one of the most interesting areas from the economic point of view. It is also the region most infected by Aedes aegypti. It has been proved that the vectors of malaria in this area are susceptible to DDT as a residual applied in the interior of the houses. It is believed that the realization of this intense campaign will result in complete sanitation of the Atlantic coast.

A similar campaign will be carried out in other zones of Colombia in 1953 and later, until there is complete control of malaria, which is still a grave problem in Colombia. About 6,800,000 persons are living in about 1,000,000 houses in malarial zones, which include warm and fair climates in places at altitudes that vary between 1 and 1,600 m. above sea level. According to data from the Ministry of Hygiene, the mortality rate from malaria, in the last few years, has been 4,000 deaths a year.

Maternity Clinic for the Middle Class.—Gustavo Restrepo, who died some years ago, presented the Hospital San Carlos to Bogotá. This hospital, which is the best in Colombia, is for tuberculous patients. Subsequently, David Restrepo, Gustavo's brother, left a large donation for constructing and organizing a maternity clinic, to be named "David Restrepo Clinic." This clinic for middle class women will be opened in August, 1952. It has all the modern equipment for the protection of the mothers and infants. There are 70 beds, and there is space for 250 more. Admission is reserved to the wives of workers with salaries from 250 to 400 Colombian pesos a month. The total charge for prenatal and postnatal care will be 100 Colombian pesos. Prenatal care will begin at the fifth month of pregnancy. Medical service, food, and the care of the patient in the clinic are free. The small amount that is paid to the clinic is used for maintenance.

Personal.—Dr. Miguel Antonio Rueda Galvis was recently appointed Minister of Hygiene. He was chief surgeon in the army and professor of urology at the National University. He has already taken steps for the realization of the following projects: (1) to carry on crusades against malaria and consumption of "chicha," (2) to increase the number of rural physicians, (3) to promote improvements in the Instituto Nacional de Higiene (National Institute of Hygiene), and (4) to unify and strengthen the crusades against leprosy and tuberculosis.

ITALY

Report on Experiments with New Antituberculosis Drug.—The editorial "New Antituberculosis Drugs" (*J. A. M. A.* 148:1034 [March 22] 1952) aroused great interest in Italy because it coincided with the first official report on isonicotinic acid hydrazide given by Prof. Vincenzo Monaldi, director of the sanatorium "Principi di Piemonte" in Naples, at the Neapolitan session of the Italian Society of Medicine. Treatment was carried out in 350 patients. Various Italian pharmaceutical firms supplied the drug. This drug is not available on the market and has not been approved by the High Commission for Public Hygiene; therefore, the physician can make studies of the drug only in sanatoriums and state approved hospitals.

Monaldi assigned the research work to various assistants as follows: in vitro experiments to Dr. Nitti; experiments on animals to Drs. Curci and Blasi; histological researches to Professor Verga, chairman of the department of pathological anatomy at the University of Naples; chemical and biochemical researches to Dr. Bazzicalupo; radiological researches to Dr. Scanziani; and researches on procedures of injection to De Marco, Cantarella, and Filograno. The clinical researches and a general coordination of the results were carried out by Professor Monaldi himself and his assistant Babolini.

Conclusions from First Results.—In vitro, isonicotinic acid hydrazide has an inhibiting activity on the development of human and bovine Mycobacterium tuberculosis in very low concentrations (about 0.05 μg per cc.), 20 times less than those required for streptomycin (1 μg per cc.). In colonies of bacteria that are increasing the inhibiting action takes places gradually. The effect is essentially bacteriostatic, but the latest studies do not exclude the possibility of a partial bactericidal effect. In guinea pigs the inhibiting effect is complete if the initial dose of the drug is given at the same time that the bacilli are inoculated. The therapeutic effect, according to the present experiments, is partial if the drug is administered after the focus caused by the inoculation is in the formative phase. The inhibiting effects in vitro and in vivo are identical for bacilli that are sensitive to streptomycin and those that are resistant to streptomycin and *p*-aminosalicylic acid. The toxicity of orally given isonicotinic acid hydrazide is minimum in the guinea pigs, the $L.D._{50}$ being 600 mg. per kilogram of body weight. The drug is not so effective on the avian Mycobacterium tuberculosis.

Therapeutic Applications in Man.—In general, from March 1, 1952, a daily dosage of 200 mg. was given to each patient in four doses preferably after the meals. In one group of patients dosages ranging from a minimum of 100 mg. to a maximum of 400 mg. were given daily. The dosage of 400 mg. did not cause any inconvenience, but the results obtained were not superior to those obtained with dosages of only 200 mg. Patients with all forms of pulmonary and extrapulmonary tuberculosis were treated. Most of them, however, had chronic multicavitary tuberculosis and highly toxic syndromes; in many patients there was resistance to streptomycin and *p*-aminosalicylic acid. Severe toxic phenomena were not observed; sometimes, there were

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The items in these letters are contributed by regular correspondents in the various foreign countries.

headaches, vertigo, mild excitement, insomnia, full and burning stomach, and nausea, but all these disturbances disappeared as soon as the dose was diminished or interrupted. No alterations of the gastric functions and the blood elements were observed. The most beneficial effects were those on the general condition of the patients, especially in the patients with highly toxic forms of tuberculosis. There were gains in appetite and body weight, euphoria, and reduction in the febrile temperature that sometimes, at the beginning of the treatment, had increased temporarily.

Allergy Researches.—In many patients a pronounced increase in the reaction to tuberculin was observed. There was also an increase in the eosinophils (up to 5%). These surprising effects are mild or minimum in patients with slowly progressive processes, widespread foci, processes involving the lobes, or bronchopulmonary forms. On the contrary, they are pronounced in patients with severe, evolutive, multicavitary, and highly secreting forms, fistulous extrapulmonary processes, and open empyema.

Local Effects.—Whereas when streptomycin is given to tuberculous patients with perifocal exudation or small foci the local and general effects are parallel, after administration of isonicotinic acid hydrazide the roentgenograms of patients with foci show no change or a slow regression. In contrast with improvements in the general condition, the radiological picture of widespread foci appears unchanged. This is contrary to what happens with streptomycin.

On the other hand, roentgenograms of patients with cavitary tuberculosis show that the outlines of the cavities become thinner and regular and the fluid disappears. Bacilli disappear from the sputum, and the sputum is diminished. Drainage from an anal fistula ceased in one patient who also had a giant cavity of the left upper lobe during the second week of treatment with isonicotinic acid hydrazide. After four weeks he was afebrile and gained 3 kg., his blood picture was improved, and he was able to resume the routine life of the sanatorium.

According to Monaldi, the new drug is effective against free bacilli (surface tuberculous forms: laryngitis, fistulous epididymitis, bronchopneumonia) that are not imbedded in, or protected by, fully developing foci of infection. For this reason, this drug has a surprising activity in severe toxic forms for which other drugs have failed.

LONDON

Hazards of Teething Powders.—A strong indictment of teething powders containing mercury is made by workers at the Royal Manchester Children's Hospital. In an article in the *British Medical Journal* they report five cases of mercury nephrosis in infants and young children, in four of which the etiological factor was a teething powder, while in the fifth it was grey tablets. The ages of the patients ranged from 11 months to 3½ years. Three of the children who were given dimercaprol recovered; of the other two, one recovered and one died. These teething powders weigh approximately 130 to 180 mg.; they contain 27 to 33% calomel mercurous chloride, the metallic mercury content being 38 to 42 mg. One patient, aged 21 months, had been given a teething powder containing 42 mg. of mercury in the form of calomel for 18 months: at first three to four powders weekly, and subsequently one or two monthly. The second patient, aged 11 months, had been given a teething powder containing 42 mg. of mercury in the form of calomel on alternate days for five months, i. e., a total intake of approximately 3 gm. of mercury. The third patient, aged 12 months, had been given a similar teething powder on alternate days for six months, i. e., a total intake of 3.8 gm. of mercury. The fourth patient, aged 19 months, (the fatal case) had been given a powder containing approximately 36 mg. of mercury daily for three or four months. The fifth child, aged 3½ years, had been given three grey tablets each containing 32 mg. of mercury, daily for five months, a total intake of 15 gm. of mercury. The authors point out that these powders are "in common use, but the danger of causing nephrosis by their prolonged ingestion is not recognized." In view of their findings they "urge that mercury compounds should be eliminated from all teething powders and that other mercury compounds, such as grey pills, be used with care, and prolonged administration be avoided in young children. Teething powders not containing mercury are free of the risks we have described."

SWEDEN

Changing Public Health Problems.—A memorandum recently presented by a body of experts to the Swedish parliament shows how modern therapeutics has shifted from emphasis on acute diseases to illnesses, such as the rheumatic and mental diseases, which are known as "folksjukdomarna" or national scourges. It has been calculated by Sven Rydenfelt that in 1945 illness was responsible for a loss of about 7% of the country's production. The loss due to rheumatic diseases and mental diseases was greatest. Diseases of the heart and tuberculosis caused the next greatest production loss, and malignant disease and diabetes were the other chief causes of lost working days. These diseases were responsible for 60% of the lost working time. Only a short time ago, more than half of the lost working time was attributed to the acute diseases; the incidence of these diseases is now much reduced by antibiotics, technical advances in operative treatment, and other measures. The training of physicians and hospital administration, hitherto profoundly influenced by the predominence of the acute diseases, must now be readjusted, in order to reflect the shift in emphasis to the chronic national scourges.

It is calculated that 245,000 Swedes suffer from rheumatic diseases to such an extent that their working capacity is reduced. At least 90,000 Swedes seek medical advice yearly for these diseases, and more than 30,000 are in need of hospital treatment for them. About 60% of all the deaths from heart disease before the age of 40 may be traced to rheumatic fever. Diseases of the heart and blood vessels account for 25,000 deaths yearly, or about 40% of all the deaths in Sweden. At present, about 250,000 Swedes, or 3.5% of the total population of Sweden, suffer from heart disease. Since heart disease is, to a great extent, a disease of old age and the aged are becoming more numerous every year in relation to the younger members of the community, the problem of heart disease is certain to increase in importance. About 150,000 of the above-mentioned 250,000 persons are over 67 years old.

The deaths from malignant disease between 1911 and 1941 rose from 110 to 152 per 100,000 inhabitants, a rise of some 40%; this may only in part be traced to improved facilities for diagnosis. It is calculated by Professor Berven that the facilities for surgical treatment of malignant disease are adequate, although they are inadequate for their radiological treatment. Malignant diseases develop in 15,000 persons in Sweden every year, and about half this number require radiological treatment. The cancer jubilee hospitals in Stockholm, Lund, and Gothenburg provide 300 beds, but at least two more hospitals with provisions for radiological treatment are required. The newly formed National Association for Combating Cancer is an outward and visible sign of the country's determination to intensify the campaign in this sphere.

The number of patients admitted to hospitals for bodily ailments has increased enormously since 1930, when it was about 355,000. In 1940, this number increased to 533,000, and, in 1950, it increased to 832,000. If the 46,000 cases of mental disease admitted to hospitals in 1950 is added to this figure, the grand total becomes about 880,000, this year. In the same year, there were 100,000 hospital beds at the disposal of patients in Sweden, 58,000 being devoted to bodily ailments. With the cost of hospital treatment approximately doubled between 1945 and 1950, it is calculated that 1,800,000 kronor are spent by the public authorities and private persons on combating disease. This figure does not cover the cost of accidents. The authors of the memorandum presented to the Swedish parliament recommend the promotion of research and teaching in connection with the national scourges responsible for chronic disease and invalidism, such as the rheumatic and mental diseases, diseases of old age, the heart, and blood vessels, and cancer. In this field, there is need for the improvement of hospital accommodation. Various administrative readjustments are also recommended.

CORRESPONDENCE

NEW ANTIHYPERTENSION DRUGS

To the Editor:—Recent announcements in the press of a method to control hypertension by the use of hexamethonium chloride and hydrazinophthalazine have inspired considerable confusion and conflicting comments in both lay and medical circles. Some tabloid newspapers gave a distorted, overenthusiastic view, other papers were reasonably factual, but several reprinted follow-up stories inspired by another investigator branding the method as "dangerous." In addition, literature mailed to physicians by the manufacturer of a preparation of hexamethonium chloride contained erroneous statements attributed to me. Since the truth lies between these conflicting statements, I am attempting to clarify the confusion.

A method for the partial temporary control of arterial hypertension has been developed, a preliminary report of which was published in the *A. M. A. Archives of Internal Medicine* (89:523 [April] 1952). This method has been extended to include approximately 120 patients suffering from arterial hypertension of all degrees of severity, including those in relatively terminal states. Good results have appeared and been sustained in most instances when both hydrazinophthalazine and hexamethonium chloride are continuously administered; contrary to claims, neither drug is more than moderately effective alone. There have been no "cures." As with all effective antihypertensive agents, and with all potent drugs, careless and indiscriminate use can be hazardous. In my experience to date, the hazards have increased in proportion to the severity of the underlying disease and have usually resulted from too rapid induction of normotension, or from hypotension. The dangers, therefore, are a result of therapeutic activity.

In benign hypertension with pathological alterations in heart, brain, or kidney, no serious reactions have been noted. In malignant hypertension without nitrogen retention, in one patient partial and temporary aphasia developed. One patient previously suffering from chronic cardiac insufficiency died of interstitial pneumonia. In malignant hypertension with nitrogen retention, reactions have been more serious. Cerebral thrombosis resulting in hemiplegia occurred in one aged man. A young woman admitted to the hospital in coma from encephalopathy recovered for three weeks then became resistant to the drugs and died of left ventricular failure. Two patients who had suffered from cardiac failure died at home in a relatively normotensive state, of unknown causes. Two patients returned to the hospital after several weeks and died of what may have been excessive retention of hexamethonium ion. In one young woman who received both drugs together initially, hypotension occurred suddenly and was protracted and severe. After her blood pressure had returned to its previous high levels she died of left ventricular failure and uremia, and, at autopsy, infarcts in the myocardium were found. It should be emphasized that all of these patients were in stages that could be considered terminal or near terminal and showed severe malignant hypertension, nitrogen retention, and cardiac decompensation or encephalopathy. The limits of the method, therefore, lie in this range of severity of the disease.

Serious consequences may follow sudden cessation of the drugs. Six patients, either voluntarily or on the advice of a physician, have discontinued therapy with the drugs; all died within four days to six weeks later of the consequences of hypertension (cardiac failure, uremia, apoplexy, or encephalopathy). Discontinuance of therapy by patients in less severe stages has resulted in return of the status quo.

Less serious side-reactions include obstructive symptoms in a few persons previously suffering from partial obstruction of a hollow organ, i. e., serous otitis media, retention of urine in the bladder, or gastric retention. Most of these could be attributed to the action of the hexamethonium ion. Other side-effects observed include conjunctivitis, blurring of vision, slight ankle edema, and partial or complete impotence in the male.

Hydrazinophthalazine has been observed to cause a recurrence of anginal pain in two instances, high fever in one, dermatitis in one, and parasthesias when large doses were given; the incidence, however, was low. Two patients were intolerant to hexamethonium because of obstructive symptoms, and four were unable to take hydrazinophthalazine. Constipation has been present in all cases and in some was annoying; it could be controlled by the regular use of laxatives.

It must be emphasized that the use of these drugs must be initiated in the hospital under careful observation. Blood pressure must be measured at four-hourly intervals day and night. Both drugs must not be given together initially. Our practice is to use hexamethonium in increasing doses for four or five days and then to add hydrazinophthalazine in small doses increasing daily. Blood pressure must be lowered slowly; serious reactions can occur when it is lowered rapidly. Small doses of each drug should be used initially (125 mg. of hexamethonium every eight hours, 25 mg. of hydrazinophthalazine every eight hours). The dose should be adjusted regularly according to the prevailing level of blood pressure; that of hexamethonium must be reduced or omitted when the systolic pressure falls to 140 mm. Hg or below. In some cases, especially if the patient suffers from severe arteriosclerosis or is in the older age groups, the level at which it must be omitted should be raised to 150 or 160 mm. Hg. In renal insufficiency, care must be taken not to cause uremia by lowering blood pressure below the point necessary for renal filtration.

On discharge from the hospital, patients must check their own blood pressure, reducing or omitting hexamethonium according to the prevailing level before each dose. This method to a large extent protects against severe hypotensive episodes. Because of the rapid excretion rates of hexamethonium and the rapid disappearance in the blood of hydrazinophthalazine, frequent doses are essential. Careful attention to the primary action of these drugs, careful observation of the patient, and knowledge of cardiovascular hemodynamics will prevent most of the severe reactions. These are potent drugs when used together and are not to be employed indiscriminately.

As far as can be determined, the "toxic" effects of hexamethonium lie in the primary action of the drug itself. Hydrazinophthalazine, however, is an unknown quantity. It contains a highly reactive chemical group, which has been found by Dr. H. M. Perry of our laboratory to combine with pyruvic acid, pherentasin, angiotonin, and sulfhydryl compounds, such as cysteine and glutathione. It also shows a strong affinity for heavy metals. An agent with the profound metabolic implications concerned in these reactions should not be employed lightly. It is not known yet whether diseases other than hypertension may be induced by the constant use of this compound. It is therefore our practice to employ these two antihypertension drugs only in patients showing pathological changes secondary to the strain produced by chronic arterial hypertension or to metabolic abnormalities resulting therefrom. Until more is known, they should not be used to reverse abnormal blood pressure readings without other signs of disease. As with other new and untried therapeutic methods, the advantages must be weighed against the disadvantages, both real and theoretical. Their use represents, therefore, a "calculated risk," which is justified when the disease is advancing. In renal insufficiency they may be hazardous.

The publicity given these drugs was instigated by a press release prepared contrary to my written request. It is unfortunate that the results of investigations cannot be offered to the medical profession for thorough clinical trial by physicians before they are released to the public. Such premature publicity serves only to confuse members of the profession and to raise false hopes in sufferers from disease.

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INEFFECTIVENESS OF "KREBIOZEN" THERAPY ON TRANSPLANTED MOUSE LEUKEMIA AND LYMPHOSARCOMA

To the Editor:—"Krebiozen," a substance obtained from the serum of treated horses, has been reported as possessing possible therapeutic value for human malignant tumors (Ivy, A. C., and others: Krebiozen: An Agent for the Treatment of Malignant Tumors, Chicago, Champlin-Shealy Co., 1951, pp. 1-106). The tests also indicated that it had no effect on a spontaneously occurring carcinoma in C3H mice nor on several transplanted tumors, including the C3HBA mammary carcinoma in C3H mice and the Jensen and Walker tumors in rats. No experimental details were given in the original publication, and, although a number of communications have since appeared (A Status Report on "Krebiozen," report of the Council on Pharmacy and Chemistry, *J. A. M. A.* **147**:864-873 [Oct. 27] 1951. Ivy, A. C.: Krebiozen, *Science* **114**:286, 1951. Rhoads, C. P.: Krebiozen, ibid. **114**:285-286, 1951) no detailed reports concerning the effect of "krebiozen" on mouse neoplasms have been noted.

We obtained "krebiozen" (in vials containing 10 μg per milliliter of "superla" white mineral oil no. 9) and used it in the experiments described below. All animals had free access to Purina Laboratory Chow and drinking water. In the first experiment 29 male dba mice, averaging 17 to 18 gm. in weight, were segregated at random into three groups containing 9, 10, and 10 animals, respectively. Mice of group 1 received no special treatment; those of group 2 were given 0.1 ml. intraperitoneal injections of white mineral oil ("superla" no. 9) for 10 consecutive days. Group 3 mice received daily for the same period 0.1 ml. of mineral oil containing 1 μg of "krebiozen." (The single dose recommended for human patients is 10 μg.) Twenty-four hours after the first injections were given to the latter groups, all animals were given leukemic implants subcutaneously from the same stock (lymphoid leukemia C1534, obtained from the Jackson Memorial Laboratories). In every mouse a palpable tumor developed, and the average survival time for each respective group was 13.2, 14.0, and 13.5 days.

In the next experiment, 40 CAF_1 mice, averaging 27 to 28 gm. in weight, were given subcutaneous transplants of an 18 day stock of a mouse lymphosarcoma (a nonmetastasizing tumor obtained from the National Cancer Institute through Dr. Delta E. Uphoff). When the tumors were palpable, 10 days later, 30 animals with tumors were randomly segregated into three groups, and these were treated as in the first experiment. Daily inspections indicated that all tumors continued to increase in size. Survival times were similar, averaging 31.7, 31.5 and 32.1 days for the respective groups.

Under the conditions of these experiments, "krebiozen" in the dosages used did not affect the course of development of either the leukemia or the lymphosarcoma.

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VOLUNTARY INSURANCE

To the Editor:—In the April 12 issue of The Journal, in the editorial entitled "Two Economists Oppose Compulsory Health Insurance," mention is made of the *Quarterly Journal of Economics* of February, 1952, "which is published by Harvard University and edited by 15 of this university's professors of economics." I think you will be interested to know that more data specifically integrating this philosophy into medical economics appeared in the July, 1950, issue of the *Harvard Business Review* in an article entitled "New Approach to Employee Health Programs," by Robert J. Clarke and David Ewing, supporting the practical use of a voluntary health insurance plan that has functioned exceptionally well over a period of 10 years. Case material following this philosophy of voluntary health insurance for advancing better social medicine (not socialized medicine) is being used in the Division of Human Relations of the Harvard Graduate Schools of Business Administration and of Public Health.

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ENTERITIS IN TOURISTS

To the Editor:—In The Journal, Sept. 22, 1951, page 358, there appeared a query and answer on enteritis in American tourists in Mexico. I should like to comment on the subject of enteritis in American tourists in general.

I have been living in Italy for two years and have come in contact with many American tourists, traveling businessmen, and students. I have yet to encounter any who have been intelligently informed on the subject of protecting their health while in Italy. There is apparently no existing means to orient the ordinary citizen who happens to be traveling abroad. Of course, he can ferret out such information from various sources on his own initiative, but I imagine it is a rare traveler who does so. The protective agency for the private citizen should be his own physician, who should advise him about immunizations, the potability of water, what to eat, and what to do in case of sickness. However, there seems to be a remarkable lack of awareness on the part of the average physician concerning health hazards abroad. A tourist friend of mine told me that her doctor at home advised against typhoid immunization because "You will only be in Italy a few weeks,"—this at a time when my Italian colleagues were reporting 5 to 10 new cases of typhoid each week in the same community!

Physicians must realize that boarding a luxury liner to Europe and staying at the best hotels do not assure protection against the diseases that are endemic in certain areas. It should be borne in mind, when advising tourists, that tuberculosis, typhoid-paratyphoid fevers, brucellosis, infectious hepatitis, and assorted unclassified diarrheas have a high incidence in Italy. The almost complete lack of modern dairy hygiene (regardless of "pasteurized" labels) renders all dairy products a potential source of any of the milk-borne infections, especially brucellosis. In certain localities the use of night soil makes the possibility of intestinal parasites a constant threat. I doubt that one could gather significant statistics on the amount of infection that is brought home by our tourist group.

The problem of diarrhea seems to be a disturbing complication of travel in Italy and is almost universal to some degree among American tourists during the summer months. In my experience this has always been a simple noninfectious enteritis on a dietary basis. From the "balanced diet" of America or northern Europe the tourist in Italy suddenly changes over to a cuisine of "pasta" carbohydrates, olive oil-drenched foods, fresh leafy salads, fresh fruits, and wine. It would be a sluggish intestinal tract that did not quicken under such encouragement. Needless to say, constipation is an uncommon complaint in Italy.

I suggest that The Journal publish current advice on recommended immunizations and dietary precautions necessary in various countries, and individual doctors can instruct their patients accordingly. In the case of actual sickness, patients can be advised to contact the nearest U. S. consulate or an American military installation if one is in the vicinity. Tourists can receive treatment at military hospitals on a pay basis, if necessary. The State Department personnel on duty at the various consulates usually have a fair knowledge of the local medical picture and can recommend a civilian English speaking physician.

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Army of the United States
Villa Diana
Tirrenia, Italy

Note:—"Immunization Information for International Travel" is the name of a pamphlet prepared by the U. S. Public Health Service, which can be obtained from the Government Printing Office, Washington, D. C., for a nominal charge.—Ed.

VETERANS HOSPITAL NEEDS DOCTORS

To the Editor:—If we had four additional doctors in this hospital we could activate 69 more beds, and, since our turnover rate is between 120% and 160%, one can estimate how many additional patients this would accommodate who are in need of medical care. We can obtain the other necessary personnel, but we cannot seem to secure the services of doctors on a full-time basis so that this hospital might operate at capacity and at the same time give satisfactory service.

This is a new hospital, opened Sept. 5, 1950. It is a beautiful brick building with white stone trim. I believe we have every known piece of useful apparatus that it is possible to buy. The climate is not too cold in winter and not too warm in summer, except for very brief intervals.

We have a fully appointed psychiatric ward, which is not activated because of the lack of a psychiatrist. We have heavy all-round general medical and surgical services, which are divided in the various specialties. To activate a new ward we need one surgeon and one physician for internal medicine. Some of our doctors are board certified and some are not. We need also an admission officer. This could be a very nice service for a man who has reached the age when he likes regular hours and less personal patient-care work. A man in his middle fifties would be ideal, one who has had a general all-round education from general practice and who has learned public relations. There must be many men throughout the country who would appreciate a service such as this and which would command a rather good salary in the Veterans Administration.

This hospital is on the main line of the Union Pacific Railroad. The Burlington Railroad also runs through the city, which comprises about 25,000 inhabitants. The city is within reasonable distance of Omaha and Lincoln, capital of the state.

I will be pleased to have this notice published in The Journal.

J. Ralston Wells, M.D.
Manager, Veterans Hospital
Grand Island, Neb.

PHILANTHROPIC FOUNDATION

To the Editor:—I have just read "The Story of the Rockefeller Foundation," by Raymond B. Fosdick. As one who has witnessed the growth of medical education for the past 40 years under the sponsorship of the Rockefeller family and who has personally known so many of the principals in this great work, I am prompted to write this note.

The author of this "greatest *medical* story ever told" deserves the commendation of the medical profession for so ably and modestly presenting his subject. He has given added dignity and prestige to our profession. This "story" should be read by every physician and allied medical worker here and abroad. Chapters 3 to 14, inclusive, should be required reading for every medical student, for in them is unfolded the history of modern medical research and progress in medical education and public health.

At this time when our traditional and benevolent capitalistic system is being undermined it is well to stress what this so-called system has done for medical progress and for the relief of suffering throughout the world, particularly in some of the countries that are none too friendly with us at the present time.

C. W. Lieb, M.D.
Rancho Santa Fe, Calif.

DEFECTIVE HYPODERMIC NEEDLES

To the Editor:—I have examined 226 hypodermic needles and found that 152, or 67%, are definitely defective, so much so that they would not meet the federal specification requirements for hypodermic needles and, in my opinion, present a therapeutic hazard.

The defects consist of deposits of metal powder in the lumen, metal slivers extending from the inner edge into the lumen, a very rough interior surface of the lumen, and rough surface of the point from grinding. As a rule, needles are defective in two or more of these respects. The rough interior seems to be a major cause of excess deposits of metal powder and wire edges. All brands showed a large percentage of failures, some more than others. Below is a breakdown of the failures of the brands we have examined under a 30 power stereo microscope for (1) powdered metal deposits, (2) wire edges, (3) metal shavings, (4) rough interior, and (5) rough grind marks.

Most needles failed in two or more respects. In all cases the points of the defective needles contained some powdered metal, metal slivers, or wire edges. Federal Specification GG-N-196 for hypodermic needles for Luer-type syringes gives the following requirements:

"C-2. *Workmanship.* The finished needle shall show first class workmanship throughout and freedom from defects impairing its utility or durability. The canula shall show a smooth finished outer surface free from pits and tool marks; an inner surface free from scale, deep pits, deep furrows, or die marks; and a lumen and hub cavity free of chips, polisher's dirt, or other foreign material.

"D-2. *Point.* . . . The outer edges of the ground surface shall be keen and both outer and inner edges shall be free from burrs and slivers. The tip shall be straight and strong and of maximum keenness."

The needles examined were about equally divided between the following gages: 26 gage, ½ in.; 24 gage, ¾ in.; and 22 gage, 1½ in. A few other sizes were included.

Manufacturer	No. Examined	No. Defective	% Defective
A	47	25	53
B	24	9	38
C	30	10	33⅓
D	29	19	66
E	28	25	89
F	41	41	100
G	27	23	85
Total	226	152	67%

I estimate that the metal slivers range in size from approximately 0.1 mm. up to 1.5 mm. In most instances, the metal slivers extend down into the lumen, but in a few cases they protrude above the openings. In three or four cases, I found metal particles or slivers in such quantities as to almost close off the tube completely. It was relatively easy to loosen the metal splinters attached to the inside of the lumen, indicating that they would probably be easily removed when fluids were injected through them, particularly with the very viscous fluids used with some of the antibiotics.

I examined only the tips of the needles for metal deposits. No doubt considerably more metal is deposited farther back in the canula because of grinding and polishing methods used in manufacturing. Apparently, few manufacturers use cleaning methods that are effective in removing wire edges and metal particles. Our results would indicate that there is very little careful inspection made of the points before shipment.

D. H. Palmer, Research Director
Hospital Bureau of Standards
and Supplies
247 Park Ave., New York 17.

THROMBOTIC OCCLUSION OF AORTA

To the Editor:—In the article "Thrombotic Occlusion of Aorta as demonstrated by Translumbar Aortograms" by Robert V. Elliott, M.D., and Mordant E. Peck, M.D., published in The Journal of Feb. 9, 1952, there is possibly an involuntary error in the following statement: "We know of only four such cases previously reported in the English literature"; for there is an article in *Surgery* (Observations on Chronic Obstruction of the Abdominal Aorta, 28:684-698 [Oct.] 1950) written by my coworkers and me, where there are 13 cases of Leriche syndrome diagnosed by translumbar and retrograde aortograms.

I also want to make it clear that Dos Santos is neither Spanish nor a urologist, but Portuguese and a surgeon, and has dedicated himself for a quarter of a century to the study of vascular diseases.

Bernardo Milanes, M.D.
C No. 451 Vedado, Havana, Cuba

MEDICAL LITERATURE ABSTRACTS

UNITED STATES

A.M.A. Arch. Dermat. and Syphilol., Chicago

65:123-260 (Feb.) 1952

Angiosarcoma in Postmastectomy Lymphedema (Stewart-Treves Syndrome). M. Jessner, F. G. Zak and C. R. Rein.—p. 123.
Dermatological Writings of Sir Jonathan Hutchinson. J. E. McCleary and E. M. Farber.—p. 130.
Lupus Erythematosus: Treatment by Combined Use of Massive Amounts of Calcium Pantothenate or Panthenol® with Synthetic Vitamin E. A. L. Welsh.—p. 137.
Attempt to Demonstrate Antibodies in Eczematous Contact-Type Dermatitis: Preliminary Report. G. H. Curtis.—p. 149.
Pemphigus Vulgaris: Clinicopathologic Study. W. Director.—p. 155.
*Lupus Erythematosus Associated with Pregnancy and Menopause. F. A. Ellis and E. S. Bereston.—p. 170.
*Cortisone Acetate in Skin Disease: Local Effect in Skin from Topical Application and Local Injection. L. Goldman, R. G. Thompson and E. R. Trice.—p. 177.
Experience with New Antipruritic Agent: Preliminary Report on 1-(β-Dimethylaminoethoxy)-3-n-Butylisoquinoline Monohydrochloride. E. F. Corson, H. A. Luscombe and H. B. Decker.—p. 187.
*Tinea Capitis Caused by Trichophyton Tonsurans (Sulfureum or Crateriforme). J. B. Howell, J. W. Wilson and M. R. Caro.—p. 194.
Experimental Staphylococcal Folliculitis: Comment on Its Possible Relationship to Acne. J. P. O'Brien.—p. 206.
Facial Granuloma with Eosinophilia (Granuloma Faciale). S. Peck, L. L. Palitz and E. Reiner.—p. 216.
Effect of Oral Emulsifying Agent on Serum Lipids in Patients with Chronic Dermatoses. L. R. McCorriston.—p. 224.

Lupus Erythematosus in Pregnancy and Menopause.—Ellis and Bereston reviewed the literature on the relationship of pregnancy and the menopause to lupus erythematosus, and surveyed current opinion by sending a questionnaire to 280 American dermatologists. Of the 120 questionnaires returned, 100 were tabulated that reported on 56 acute, 13 subacute, and 31 chronic discoid cases of lupus erythematosus. Apparently acute lupus erythematosus frequently had a disastrous effect on the fetus or newborn child (16 deaths). In 25 patients the disease became worse or death occurred during pregnancy. In 14 patients pregnancy had no effect on the acute lupus erythematosus; 5 patients improved before and 12 improved after delivery. Some patients with the subacute type of lupus erythematosus improved during pregnancy; the condition of others remained stationary or became worse, but the changes were about what would be expected in subacute lupus erythematosus not associated with pregnancy. There were six spontaneous abortions, which suggests that even subacute lupus erythematosus may have a serious effect on the fetus. Chronic discoid lupus erythematosus associated with pregnancy had almost no effect on the mother or the pregnancy. The questionnaire revealed that the onset of lupus erythematosus may occur after the menopause, but the prognosis is apparently not altered by the endocrine changes accompanying menopause.

Cortisone in Skin Disease.—Cortisone ointment applied topically to the skin in concentrations up to 750 mg. per 30 gm. of ointment produced no significant therapeutic responses in 114 patients. When cortisone was injected superficially into the skin by syringe and needle or by the hypospray® jet injection instrument, a significant number of extensive inflammatory tissue reactions were observed grossly, and even more frequently in microscopic sections. In 65 patients receiving cortisone with the hypospray© a striking improvement was observed in some cases, but these were not controlled. Initial experiments with the local injection of compound F show definite inhibition of both the local eczematous and the local tuberculin type of response. Further studies with the injection of compound F, and mixtures containing compound F, for diseases of the skin amenable to cortisone therapy are warranted, for, if there is any local action of compound F, injection rather than topical application should be more effective. For these studies, in which relatively superficial injections of the steroid are required, attempts should be made to reduce the local irritant quality of the suspensions now available.

Tinea Capitis Caused by Trichophyton Tonsurans.—Infection of the scalp by the fungus Trichophyton tonsurans seems to be increasing. During the past three to four years Howell and associates have observed 37 cases of tinea capitis caused by T. tonsurans in children and 7 in adults. The increasing frequency has been especially noted in Texas and California, and it is possible that an epidemic invasion from Mexico is in process. Scalp infections caused by T. tonsurans differ from those due to species of Microsporum. The former should be suspected when the involved plaques tend to be angulated or polygonal rather than rounded, when the hairs are broken off so close to the surface of the scalp that they appear as black dots, and when the infection is unduly prolonged or continues after puberty. Fluorescence is almost uniformly absent and filtered ultraviolet light therefore cannot be used for exclusion. The clinical course of any single plaque usually includes three stages: the epidermal phase, the follicular invasive phase and the healing phase. These are described, and it is pointed out that in mild cases the patches may be mistaken for seborrheic dermatitis. In adults T. tonsurans infection may resemble discoid lupus erythematosus. The authors observed two cases in which these conditions had to be differentiated. There are probably mild cases in children in which spontaneous healing occurs. In such cases the infection "burns out" in time, with or without the assistance of topical therapy and/or epilation. It is doubtful that the infection in adults ever heals spontaneously. Topical therapy appears to be of questionable value. When kerion occurs, healing generally follows within a few weeks.

American Journal of Clinical Pathology, Baltimore

22:1-90 (Jan.) 1952

The Trumpets Sound: Presidential Address. F. W. Sunderman.—p. 1.
*Brucella in Tissues Removed at Surgery. L. A. Weed, D. C. Dahlin, D. G. Pugh and J. C. Ivins.—p. 10.
Liver Damage After Prolonged Urethane Therapy. G. C. Meacham, F. W. Tillotson and R. W. Heinle.—p. 22.
Universal Serologic Reaction in Neoplastic Disease. E. S. Wynne, C. L. Gott, L. R. Ortega and W. O. Russell.—p. 28.
Paper Chromatography for Identification of Common Barbiturates. E. J. Algeri and J. T. Walker.—p. 37.
Chromatographic Identification of Reducing Sugars in Urine. L. H. Sophian and V. J. Connolly.—p. 41.
Primary Sarcoma of Spleen: Report of Case with Fatal Spontaneous Rupture. E. G. Laforet.—p. 46.
Virus Hepatitis in Laboratory Workers: Report of Three Cases. A. Kahn Jr., H. M. Armstrong and R. M. Eubanks.—p. 56.

Brucella in Tissues Removed at Surgery.—During the past six years at the Mayo Clinic, Weed and associates studied a large number of patients with chronic infections and found that the majority of the lesions were caused by (1) the tubercle bacillus, (2) some kind of mycotic organism, or (3) some species of Brucella. In the present report the authors describe 13 cases in which Brucella organisms were found. They comment on the roentgenologic and pathological aspects of these cases, and conclude that Brucella organisms may be isolated from surgical specimens when there is no obvious history or clinical course to suggest brucellosis. The agglutination reactions on serum are usually positive, but may be negative in certain cases of chronic brucellosis. The gross and microscopic appearances of a lesion may be nonspecific, or they may be strikingly similar to tuberculosis. Histological examination alone is misleading in the diagnosis of chronic lesions due to Brucella. Brucella may be un-

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Titles marked with an asterisk (*) are abstracted.

recognized as the cause of bursitis unless the organism is isolated by bacteriological methods. The procedure used involved grinding aseptically removed tissues in a sterile mortar. Sterile isotonic sodium chloride solution was added to make a 10 to 20% emulsion. Fluids from a joint or pus from an abscess were handled in the same fashion as tissue. The fluid material was cultured for Brucella, tubercle bacilli, fungi, and such common organisms as streptococci and typhoid bacillus. The cultures for Brucella were made by inoculating hormone blood agar in Petri dishes and incubating under 10% carbon dioxide. The cultures that were positive for Brucella showed growth in two to four days. Surgical removal of a localized lesion may be required as a supplement to chemotherapy, even though the diagnosis of brucellosis is already established.

American Journal of Obstetrics & Gynecology, St. Louis

63:1-240 (Jan.) 1952. **Partial Index**

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*Studies in Rh Sensitization: V. Importance of Titer of Rh Antibodies in Sensitized Pregnant Rh-Negative Woman for Prognosis. A. S. Wiener, R. Nappi and E. B. Gordon.—p. 6.
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Results Following Therapeutic Abortion in Pulmonary Tuberculosis. G. Schaefer and H. H. Epstein.—p. 129.
Interaction of Hormone-Induced Tissue Growth and Vital Inorganic Elements in Uterine Carcinogenesis.—J. Hofbauer.—p. 136.
Spinal Anesthesia for Vaginal Delivery with Special Reference to Prevention of Postpartum Headache. J. W. Huston and T. B. Lebherz. —p. 139.

Prognostic Importance of Rh Antibodies in Rh-Negative Women.—The titer of Rh antibodies in the sensitized Rh-negative mother's serum is the most important factor determining whether an Rh-positive fetus will be stillborn or not, although the baby's resistance to Rh antibodies also plays a role in prognosis. Rh-negative mothers without Rh antibodies in the serum have as good a chance to have normal babies as any Rh-positive mother. The chances of a pregnancy resulting in a stillbirth or neonatal death ranged from 1.5% when the Rh-negative mother was not sensitized to as high as 72.2% when the mother was sensitized and had an antibody titer as high as 65 to 256 units. Of 153 liveborn Rh-positive babies of sensitized Rh-negative mothers, 137 were erythroblastotic; among these, the mortality rate was closely correlated with the titer of Rh-antibodies in the maternal serum, ranging from 6.5% for titers of 4 units or less (by the albumin-plasma method) to 50% for titers of from 65 to 256 units. Prenatal determination of the maternal antibody titer makes it possible to predict the probable outcome of a pregnancy and to prepare for effective treatment of an erythroblastotic infant.

Cervical Mucus Secretion Test.—Changes in cervical mucus secretion are known to occur during the normal menstrual cycle, one of the most conspicuous being the development of a fern-like pattern. Investigation showed the existence of this pattern from the 5th or 7th up to the 20th or 22nd day of the cycle in women with normal ovulatory menstrual cycles who had had normal pregnancies. The fern pattern was followed by a cellular type of pattern, which lasted until menstruation began and continued for from five to seven days thereafter. No such variation was found in a group of women in whom failure of ovulation had been proved by various repeated tests; the fern pattern persisted throughout the cycle. Tests carried out on women with menopausal symptoms showed a complete absence of the fern pattern. Ten of these women received estrogen therapy and several days later the fern-like pattern appeared, disappearing again when treatment was discontinued. Absence of the fern pattern in cervical smears taken from two days to seven months after the missed period was also noted in 300 pregnant women. The fern pattern is probably a result of estrogen activity, and its disappearance accompanies a decline in the progesterone level. Persistence of the pattern throughout the cycle indicates that ovulation has not taken place and that there has been no progesterone activity. Absence of the pattern after a missed period results from persistence of the corpus luteum and a high progesterone level and indicates pregnancy.

American Journal of Pathology, Ann Arbor, Mich.

28:1-170 (Jan.-Feb.) 1952

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American Surgeon, Atlanta, Ga.

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Reconstructive Methods for Surgical Defects of Chest Wall: Including Use of Pre-Formed Lucite Plates. C. A. Hardin, C. F. Kittle and P. W. Schafer.—p. 201.
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Daily Mucin Secretion in Normal and Vagotomized Total Gastric Pouches of Dogs. C. F. Kittle and T. L. Batche[illegible]r.—p. 217.
Metabolism of [illegible] [illegible]lowing Its Sub[illegible]noid Injection: Preliminary Report. P. H. [illegible] G. Guernsey [illegible] M. Devine.—p. 224.
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Immediate Sub-Total Gastrectomy for Acute Perforated Peptic Ulcer. H. Auchincloss Jr.—p. 134.
Delayed Primary Gastrectomy for Perforated Peptic Ulcer. H. C. Dodson Jr.—p. 139.

Esophageal Hiatus Hernia of the Diaphragm.—Sweet reports observations on 111 patients with esophageal hiatus hernia who were operated on by the transthoracic approach. The customary classification of these hernias into the "short esophagus" and the "paraesophageal" types corresponds to the roentgenologic appearances, but of 87 patients in whom roentgen examination indicated that the esophagus was short, only four were found to have the truly short variety. The author considers that the terms "sliding hernia" and "parahiatal," respectively, convey a more accurate impression of the anatomical features of these two types. As a third form he mentions the "composite type" of hiatus hernia. The first important step in the repair of the hernia consists of the ablation of the peritoneal sac. This is accomplished by plication and inversion without excision, by excision of the sac, or by a combination of both procedures. The second essential step consists in reducing the size of the hiatus by means of sutures placed in the diaphragmatic muscle on either side of the esophagus in a manner to reduce the enlarged aperture. The correct diameter has been achieved when, with a Levin tube in the esophagus, the surgeon's index finger can be inserted through the posterior portion of the hiatus without compressing the esophagus. If the tissues are so fragile that the sutures might be torn out, the closure can be reinforced with strips of fascia lata. The edges of the mediastinal pleura are drawn togethr with sutures of fine silk, and a few sutures are used to reattach this membrane to the diaphragm near the hiatus; the lung is reexpanded, and a catheter is inserted through a short incision. Closed drainage is provided. A counterincision was employed in eight patients for the purpose of abdominal exploration and in 10 patients, a vagotomy was done for the relief of a coexisting duodenal ulcer or severe gastritis. Complications attributable to the hernia repair occurred in 16 patients; in five others some of the unpleasant sequelae of vagus nerve interruption were observed. Of 108 patients followed for six months or more, 94 were completely relieved and 10 had improved. In some who were only partially relieved or not at all, the symptoms were due to causes other than the hiatus hernia. Two of the 111 patients died during the first year after the operation, one of senile cerebral arteriosclerosis and the other of carcinoma of the pancreas.

Portacaval Venous Shunt, with Side-to-Side Portacaval Anastomosis.—Large and associates deduced from experiments on dogs that venous shunts for portal hypertension in humans ought to be performed in such a manner as to avoid complete diversion of the portal blood flow away from the liver. Side-to-side portacaval anastomosis or splenectomy with end-to-side splenorenal anastomosis would satisfy these requirements. The authors performed such venous shunt operation for portal hypertension on 18 patients. Twelve of the patients who were operated on had bleeding esophageal varices but not ascites, and all had good liver function preoperatively. Excellent results were obtained in 9; that is, no further hemorrhage occurred and the patients are ambulatory, and, in most cases, can work. One of the three in whom results were poor died six months after operation in hepatic coma, another bled again on at least one occasion, and the third, who has polycythemia rubra vera, has shown progression of his disease. Three patients who were operated on for rapidly recurring ascites had been treated medically until no further improvement could be expected. All three are alive and have no ascites at present, but they developed ascites rapidly in the immediate postoperative period and did not show improvement until a month or more after the shunt had been done. Three patients had both hemorrhage and ascites and two of them died in hepatic coma within a month, the only two operative deaths in the entire group of 18. Both patients had such poor liver function preoperatively that probably neither should have been operated upon. The third patient in this group had no further bleeding and was free of ascites for almost one year and then died. Necropsy performed in this case and in one of the operative deaths disclosed that the anastomosis was patent in each.

Blood, New York

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Effects of Pituitary and Adrenal Hormones on Numbers of Thoracic Duct Lymphocytes. G. F. Hungerford, W. O. Reinhardt and Choh Hao Li.—p. 193.
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Incidence, Distribution and Significance of Megakaryocytes in Normal and Diseased Human Tissues. E. B. Smith and J. Butcher.—p. 214.
Effects of Total Body X-Irradiation on Blood Coagulation in Rat. S. H. Cohn.—p. 225.
Anticoagulant Effect of Bacterial Polysaccharides in Normal and Thrombocytopenic Plasma of Leukemia. G. Freeman.—p. 235.
Urinary Excretion of Vitamin B_{12}. M. F. Sokoloff, E. H. Sanneman Jr. and M. F. Beard.—p. 243.
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California Medicine, San Francisco

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Common Lesions of Urethra in Women. C. E. Burkland.—p. 69.
*Newer Concepts of Anatomy of Lungs: Advantages to Surgeons, Internists, Bronchoscopists and Radiologists. H. H. Lindner and J. B. de C. M. Saunders.—p. 74.
Some Relationships Between Heart Attacks and Paralytic Strokes. C. W. Olsen.—p. 77.
Changing Epidemiologic Aspects of Typhoid Fever in California. R. Brunetti, A. C. Hollister Jr. and F. Ames.—p. 80.
Complications of Tattooing. G. Lubeck and E. Epstein.—p. 83.

Metastatic Thyroid Carcinoma.—Of 260 patients with thyroid carcinoma operated on at the University of California Hospital from 1912 to 1950, 26 presented as the first symptom a painless nodule distant from the thyroid gland, and the thyroid itself was considered normal on clinical examination. The tumor was in the right lateral neck in 12 patients, in the left lateral neck in 10, and in the other four cases the tumor was located in the clavicle, the pharynx, the breast, and parotid gland, respectively. The duration of symptoms ranged from 2 months to 18 years.

In all but 3 of the 26 patients a small primary neoplasm of the thyroid gland was observed at operation or on microscopic examination. The majority of these patients were treated by total thyroid lobectomy on the side of the lesion, together with either excision of palpable metastases or radical neck dissection. In one instance the lateral mass was removed and the gland itself was not explored. Subtotal or total thyroidectomy was done in the 10 patients in whom the primary neoplasm lay close to the midline. Ten patients received postoperative x-ray therapy to the neck or area of metastasis. Of the 26 patients, 17 were alive and well, without evidence of recurrence, from 1 month to 15 years after operation. Four patients were living and asymptomatic with known metastases 12, 10, 4, and 2 years after thyroidectomy. One patient died of an intercurrent condition without evidence of recurrent carcinoma. In four patients death was due directly to the cancer and metastases. Radical neck dissection with either total lobectomy or total thyroidectomy would seem to be the operation of choice in the treatment of these patients. The ultimate prognosis, even in the presence of metastases, is relatively good. Primary carcinoma of the thyroid gland should be considered in the presence of tumors of the side of the neck, even in the absence of palpable nodules in the gland itself.

Anatomy of the Lungs.—In the newer concept of the anatomic divisions of the lungs, the bronchopulmonary segment is the primary unit. Specific lung areas are identified by their relationship to the branch of the bronchus that serves them. The left upper lobe apical segment, for example, is that which is supplied by the left upper lobe apical bronchus. The boundaries of the segments are definitive; with careful technique it is possible to dissect out the thin connective tissue planes between the various bronchopulmonary segments. The normal as well as the accessory pulmonary fissures lie in the planes between the bronchopulmonary subdivisions. It should be noted that the two divisions of the right medial lobe lie in a plane lateral and medial to one another; it is in this area only that there is a fundamental distinction between the right and left lungs. Some diseases of the lungs tend to progress only "through channels," reaching a segment via the specific airway serving it, and then frequently remaining within the segmental boundaries. A nomenclature that would indicate the relationship between the segment of the lobe in question and the branch of the bronchus supplying it would considerably diminish the number of anatomic terms and make for easier understanding of the relationship and the locale of the segment and the bronchus referred to.

Connecticut State Medicine Journal, Hartford

16:1-70 (Jan.) 1952

Physician's Responsibility in Civil Defense. W. L. Wilson.—p. 3.
Value of Influenza Virus Vaccination in Industry. C. F. Yeager.—p. 7.
Recurrent Umbilical and Low Midline Abdominal Incisional Hernias in Adipose Women. C. L. Larkin.—p. 9.
Political Medicine. J. T. Patterson.—p. 15.

Delaware State Medical Journal, Wilmington

24:1-34 (Jan.) 1952

Otologic Applications of Audiology. E. R. Mayerberg.—p. 1.
Conservation of Hearing: Joint Project of Otologist and Audiologist. E. N. Johnson.—p. 2.
Procedures for Treatment of Communicative Disorders Resulting from Impairment of Hearing.—L. L. Horne.—p. 5.
Role of the Speech Therapist in the General Hospital. D. M. Knapp.—p. 12.
Cortical Steroids and Clinical Medicine. L. C. McGee.—p. 14.
*Intra-Arterial Histamine in Peripheral Vascular Disease. J. F. Flanders, G. B. Heckler and R. E. Jones.—p. 17.
Clinical Value of Venous Pressure Measurements. J. M. Louro.—p. 21.

Histamine Given Intra-Arterially in Peripheral Vascular Disease.—Flanders and associates describe an apparatus by which varying amounts of histamine may be injected into the femoral artery. Generally, an initial dose of 0.25 to 1.0 mg. of histamine base in 50 cc. of isotonic sodium chloride solution is injected in 15 minutes. Subsequent doses depend on the patient's response to the initial injection. In most cases the interval between injections was 48 hours. Thirty-five patients with peripheral vascular disease were treated with from 1 to 40 intra-arterial histamine injections without serious side-effects. Eighteen of the 35 patients had arteriosclerosis obliterans. Intra-arterial histamine therapy produced the best results in patients who had residual cramps and claudication. Seven patients with arteriosclerosis obliterans, who had rest cramps and claudication as the only symptoms, required one to two injections to render them asymptomatic for a period of 4 to 12 months. Of the nine stasis ulcers treated, three healed promptly and remained well for periods up to 15 months. Another healed completely but recurred after three months. In two cases the results were equivocal and three ulcers were not benefited. Four of six ulcers of the toes due to arteriosclerosis obliterans healed. Improvement resulted in one case of immersion foot, but could not be attributed entirely to histamine. The treatment failed in three cases of arterial emboli of the popliteal artery.

Endocrinology, Springfield, Ill.

49:677-838 (Dec.) 1951. **Partial Index**

Antagonistic Relationship Between Testosterone and Thyroxine in Maintaining Epidermis of Male Rat. H. Eartly, B. Grad and C. P. Leblond.—p. 677.
Effect of Hypophysectomy at Beginning of Proestrus on Maturing Follicles in Ovary of Rat. G. B. Talbert, R. K. Meyer and W. H. McShan.—p. 687.
Effect of Fractures upon Urinary Electrolytes in Non-Adrenalectomized Rats and in Adrenalectomized Rats Treated with Adrenal Cortex Extract. D. J. Ingle, R. C. Meeks and K. E. Thomas.—p. 703.
Localization of Radioactivity After Administration of Labeled Prolactin Preparations to Female Rat. M. Sonenberg, W. L. Money, A. S. Keston and others.—p. 709.
Effect of Intrasplenic Ovarian Graft on Pituitary Gonadotropins. W. E. Achilles and S. H. Sturgis.—p. 720.
Ascorbic Acid Intake and Adrenal Cortex. R. C. Stepto, C. L. Pirani, C. F. Consolazio and J. H. Bell.—p. 755.
Mechanism of Epinephrine-Hyperglycemia. M. Somogyi.—p. 774.
Dual Control of Adrenocorticotrophin Release. C. Fortier.—p. 782.
Effect of Ascorbic Acid, Potassium Chloride Flooding, and Cortisone on Course of Formaldehyde-Irritation Arthritis. H. Bacchus.—p. 789.
Role of Progesterone in Production of Cyclic Vaginal Changes in Female Guinea Pig. D. H. Ford and W. C. Young.—p. 795.
Fibrinolysin-Antifibrinolysin System in Serum: Mechanism of Its Endocrine Control. G. Ungar, E. Damgaard and F. P. Hummel.—p. 805.

Hawaii Medical Journal, Honolulu

11:131-190 (Jan.-Feb.) 1952

Subdural Hematoma in Infants: Diagnosis, Management and Report of Six Cases. J. J. Lowrey.—p. 145.
Obstructive Pneumonitis of Middle Lobe: "The Middle Lobe Syndrome." J. E. Ferkany.—p. 149.
Involutional Melancholia. K. H. Rusch.—p. 152.

Journal of Allergy, St. Louis

23:1-94 (Jan.)* 1952

Pulmonary Function Studies in 20 Asthmatic Patients in Symptom-Free Interval. H. D. Beale, W. S. Fowler and J. H. Comroe Jr.—p. 1.
Serologic Investigations on Edema Fluid from Nasal Polyps: Preliminary Report. P. Berdal.—p. 11.
Hospital and Ambulatory Treatment of Asthma and Eczema with ACTH and Cortisone. H. S. Baldwin and P. F. deGara.—p. 15.
Clinical Studies with Cortisone by Mouth, Cortisone by Injection, and ACTH in Treatment of Asthma. W. Franklin, F. C. Lowell, I. W. Schiller and H. D. Beale.—p. 27.
Oral Cortisone Therapy in Ragweed Hay Fever. E. Schwartz, L. Levin, H. Leibowitz and others.—p. 32.
*Roentgen Studies of Allergic Children with Disturbances of Pylorus Resulting from Food Sensitivity. J. H. Fries.—p. 39.
Preliminary Pollen Analysis of Miami, Florida, Area. L. B. Fly.—p. 48.
*Headache Studies, Statistical Data. I. Procedure and Sample Distribution. H. D. Ogden.—p. 58.
Psyche and Allery. E. Wittkower.—p. 76.

Disturbances of Pylorus from Food Sensitivity.—Fries describes studies on 30 allergic children ranging in age from 4 to 14 years who had repeatedly had gastrointestinal disturbances in the form of nausea, vomiting, and epigastric distress shortly after ingesting offending foods. About a week after a roentgenographic control study with barium sulfate and water, a similar study was made, employing barium sulfate and water to which the offending allergen was added without the knowledge of the patient. Previous trials had revealed the amount of allergen that would be needed to produce a pronounced gastrointestinal disturbance. These varied from 2 cc. to 12 cc. In the control series, the barium began to leave the stomach immediately, or within 10 minutes after ingestion. In the allergen series, a delay of 20 minutes or longer in the passage of the [illegible] barium mixture from the stomach was observed [illegible] children who were studied by fluoroscopy. In some instances, a persistent or intermittent narrowing of the pyloric canal was noted. The changes in the pylorus were accompanied by abdominal pain, epigastric distress, and in some instances by vomiting. Coincident with these findings, gastric peristalsis was diminished or absent in 17 subjects. Hypotonicity of the stomach was observed in 14 of these. Roentgenograms largely confirmed the fluoroscopic findings. In 13 subjects gastric retention ranging from 10% to 66% was observed at the six-hour period, at which time the pylorus often still appeared deformed. Studies with the same allergen were repeated in three patients on different days, and similar pyloric changes occurred each time. One patient, sensitive to eggs, fish, and nuts, responded on different occasions with the same gastrointestinal symptoms to trial feeding with each of these offenders. In patients exhibiting roentgenologic evidence of pyloric changes, the possibility of an allergic cause must be taken into consideration.

Headache Studies: Statistical Data.—Ogden undertook a statistical study of the incidence of headache in nearly 6,000 persons, but only 4,634 satisfactorily cooperating persons are considered in this report. In order to cross-check accuracy, different surveying procedures were employed in three groups. Group 1 included employees of several hospitals, that is, various types of personnel, almost paralleling the general adult employed population. Questionnaires were distributed and collected through the management of the hospitals. In order to determine whether there would be any great difference between answers to questionnaires and those obtained by interviewers, in group 2 several diverse categories of persons were interviewed, including salesmen, saleswomen, housewives, and manual laborers. Group 3 consisted of persons intelligent enough to give accurate responses without interviewing, including medical students, physicians, and nuns. A fourth group consisted of the total of the previously mentioned groups. Findings were recorded on International Business Machine cards, so that calculations could be made on virtually any factor. The incidence of headache of all types in the total group was 64.8%, pain in the frontal area constituting the most frequent type. Persons with headache have a significantly higher incidence of respiratory symptoms and a significantly greater incidence of familial allergy. Only 18% of persons with headache seek medical aid specifically for this complaint. Headache incidence is greater among females, younger adults, single people, educated persons, executives, students, and professional groups. It is obvious therefore that there are several background factors to be considered in the management of headache. Recognition of the possible allergic basis may be very important, along with the handling of the mental, emotional, or occupational problems.

Journal of International College of Surgeons, Chicago

17:1-132 (Jan.) 1952

Nonunion of Supracondylar Fractures of Femur. C. Scuderi and A. Ippolito.—p. 1.
Bursitis and Myofascitis. Treatment by Local Injections of Cortisone: Preliminary Report. E. J. Orbach.—p. 19.
Pelvic Anchor Sacral Rest. C. L. Hall and H. W. Wellmerling.—p. 30.
*Occurrence and Treatment of Potassium Deficiency in Surgical Patients. H. S. Lans, I. F. Stein Jr. and K. A. Meyer.—p. 34.
Rhomboid Ligament in Surgery of Sternoclavicular Joint. H. Milch. —p. 41.
Acute Sigmoid Diverticulitis. J. W. Thompson.—p. 52.
Synovial Sarcoma: Report of Five Cases. S. R. Maxeiner and B. H. McLaughlin.—p. 65.
*Indications and Contraindications for Intestinal Intubation in Small Bowel Obstruction. F. I. Harris and W. Leff.—p. 78.
Early Clinical Diagnosis of Carcinoma of Colon. S. A. Portis and C. H. Lawrence.—p. 86.
Diverticulitis of Colon. R. W. McNealy and F. D. Wolfe.—p. 92.
Renal Factor in Nontoxemic Hypertensive States of Pregnancy. W. M. Silbernagel.—p. 96.
Rare Anomaly in Peritonitis Involving Small Bowel. J. A. Tesson. —p. 102.
Reverse Pectoral Tendon Action for Adolescent Obstetrical Paralysis. T. Cacioppi.—p. 108.

Potassium Deficiency in Surgical Patients.—Of 290 surgical patients with potassium deficiency states studied and treated during a nine month period at Cook County Hospital, 221 had hypokalemia (hypopotassemia) on admission, and in 69 potassium deficiencies developed postoperatively. The pathogenic factors in potassium deficiency are as follows: (1) loss of gastrointestinal secretions (gastrointestinal suction drainage, without adequate replacement of potassium, often leads to potassium deficiency after four or five days); (2) prolonged use of potassium-free parenteral solutions; (3) limitation of potassium intake in food; and (4) increased renal excretion of potassium resulting from surgical trauma, with its attendant alarm reaction, diuresis due to parenteral infusions of sodium chloride or dextrose, and disturbances in acid-base balance. The commonest clinical picture consists of gradually increasing muscular weakness, loss of energy, anorexia, listlessness, and mental depression. Abdominal distention is also frequent preoperatively and postoperatively. Treatment of potassium deficiency is an important addition to the care of the surgical patient and is often essential to his survival. Intravenous administration of a solution containing 3 gm. of potassium chloride (40 mEq. of potassium) in a liter of isotonic sodium chloride solution, amino acids, or 5% dextrose solution, not faster than 120 to 180 drops (8 to 12 cc.) per minute, is recommended for general use. In the authors' patients it was followed, with few exceptions, by prompt and often striking improvement in muscular strength, mental attitude, energy, and appetite, together with subsidence of abdominal distention and elevation of the serum potassium concentration.

Intestinal Intubation.—The authors classify as "small bowel distention" those types of simple obstruction that are amenable to intubation as definite therapy. "Small bowel distention" is synonymous with the condition represented by the distended loops of small bowel seen on the flat film in cases of clinically suspected intestinal obstruction. Indications for intubation as definitive treatment are as follows: preoperative or postoperative peritonitis, postoperative adhesions, and reflex distention (reflex ileus). One may expect success in 80 to 90% of the cases in this group. Careful clinical and roentgenologic follow-up is absolutely essential to recognition of the contraindications to continuation of this treatment, which are as follows: appearance of dark, bloody drainage in the tube, increase in small bowel distention as shown by flat films, lack of clinical improvement after 24 hours of successful intubation, increase in pulse rate, fever, abdominal pain or leukocyte count, and the presence of an abdominal mass not previously noted. It is emphasized that distention of the small bowel after abdominoperineal resection is a condition in which intubation therapy may ultimately prove to be dangerous. Strangulating and vascular obstructions and obstructions of the large bowel should be treated by immediate surgical intervention. Intubation may be used in these cases as an adjuvant to preoperative preparation and postoperative care, but not as definitive treatment. A danger of intubation therapy is that the initial relief may delay much-needed surgical treatment.

Journal-Lancet, Minneapolis

72:1-48 (Jan.) 1952

*Clinical Uses of Artificial Kidney. F. J. Lewis, M. P. Reiser, R. H. Egdahl and others.—p. 1.
Amyloid Disease with Two Case Reports. L. E. Wold.—p. 8.
Present Status of ACTH and Cortisone in Rheumatic Fever. F. H. Adams.—p. 11.
Prolonged Labor. C. P. Huber.—p. 13.
Medical Management of Bilateral Adrenalectomized Patients. A. C. Fortney.—p. 15.
Auditory Projection Technique for Psychiatric Research. H. A. Wilmer and M. A. Husni.—p. 17.

Clinical Use of Artificial Kidney.—Reviewing the history of the artificial kidney, Lewis and associates say that they used Merrill's modification of the Kalff artificial kidney 26 times in 15 patients. Eight of these patients had acute renal failure, five had chronic renal failure, one had hepatic cirrhosis, and one had encephalitis complicated by diabetic acidosis. Most of these patients were temporarily benefited by treatment with the artificial kidney. A prompt lowering of the protein metabolite levels in the blood and an adjustment of the serum electrolyte levels toward normal was obtained in every case. It was possible to reduce the body weight when overhydration was present. It is suggested that the artificial kidney be used in those cases of acute renal failure in which hyperkalemia or overhydration has developed and when oliguria has persisted more than six days. In patients with chronic uremia the artificial kidney may be helpful in preparation for surgery.

Journal Nat. Cancer Inst., Washington, D. C.

12:465-698 (Dec.) 1951. Partial Index

Cytochemistry and Morphology of Neoplastic and Nonneoplastic Human Lymph Node Cells with Special Reference to Hodgkin's Disease. G. A. Ackerman, R. A. Knouff and H. A. Hoster.—p. 465.
Histopathogenesis of Squamous-Cell Carcinoma Induced in Forestomach of Mice by Intramural Injection of 20-Methylcholanthrene. H. I. Firminger and H. L. Stewart.—p. 491.
30-Day LD-50 of Two Radiations of Different Ion Density. J. W. Hollcroft and E. Lorenz.—p. 533.
Role of Chemotherapy Research Laboratory in Clinical Cancer Research. M. J. Shear.—p. 569.
Metabolism of N^{15}-Labeled *p*-Dimethylaminoazobenzene in Rats. M. Berenbom and J. White.—p. 583.
Histology and Cytochemistry of Human Skin: I. Metachromasia in Mons Pubis. W. Montagna, H. B. Chase and H. P. Melarangno.—p. 591.
Myelogenous Leukemia in Cat. W. H. Eyestone.—p. 599.
Histological Effects of Long-Continued Whole-Body Gamma-Irradiation of Mice. B. Spargo, J. R. Bloomfield, D. J. Glotzer and others.—p. 615.
Paper Partition Chromatography of Free Amino Acids and Peptides of Normal Human Gastric Juice. D. R. Gilligan, J. R. Moor and S. Warren.—p. 657.

Journal of Nutrition, Philadelphia

46:1-140 (Jan.) 1952. Partial Index

Deposition of B Vitamins in Normally Developing Fetuses as Evidence for Increased Vitamin Needs of Rat for Reproduction: II. Pantothenic Acid and Biotin. H. Lewis and G. Everson.—p. 27.
Biological Availability of Certain Foods as Sources of Riboflavin. G. Everson, E. Pearson and R. Matteson.—p. 45.
Specific Effect of Niacin on Growth. B. Sure, L. Easterling and S. Jen.—p. 55.
Niacin Deficiency in Rhesus Monkey. D. V. Tappan, U. J. Lewis, U. D. Register and C. A. Elvehjem.—p. 75.
Dietary Factors Affecting Gastric Secretion in Rat. E. A. Hawk and J. M. Hundley.—p. 87.
Effect of Aureomycin and Penicillin upon Vitamin Requirements of Rat. H. E. Sauberlich.—p. 99.
*Factors Concerned with Different Erosive Effects of Grapefruit and Grapefruit Juice on Rats' Molar Teeth. R. A. Gortner Jr. and R. K. Kenigsberg.—p. 133.

Enamel-Erosive Effects of Grapefruit and Grapefruit Juice.—Miller in 1950 compared the erosive effects of various acid fruits and the juices of the fruits and found that the juices were 3 to 10 times more erosive than the equivalent amount of the fresh fruit. Although unable to explain these results, she pointed out that they were not due to differences in titratable acidity. Gortner and Kenigsberg investigated further the enamel-erosive properties of grapefruit and grapefruit juice. They also found that consumption of grapefruit juice causes considerably greater erosion of the lower molars of rats than ingestion of grapefruit sections with similar juice content and pH. When the pressed juice was reconstituted into a simulated "fruit" by the addition of 3% bactoagar or 5% foamed, compressed gelatin, these preparations affected the teeth in about the same manner as the natural fruit and were much less destructive than the juice from which they were prepared. This implies that the differences are not due to some protective substance present only in the fresh unpressed fruit, or to some destructive agent arising in the juice during the squeezing process. By pair-feeding eight completely desalivated rats with litter-mate controls, it was shown that salivary buffering had no detectable influence on the extent of enamel erosion induced by either grapefruit or grapefruit juice, and could not explain the different destructive effects of the two supplements. It is concluded that mechanical differences, such as the consistencies of the supplements and the different manners of ingestion, rather than chemical differences, are responsible for the effects noted.

Medical Annals of District of Columbia, Washington

21:1-60 (Jan.) 1952

Fungus Infections and Their Treatment. S. M. Peck.—p. 1.
Application of Electrophoresis to Medical Problems. M. Reiners.—p. 11.
Causes and Significance of Hoarseness. P. H. Holinger.—p. 17.
"That Full Feeling." W. T. Gibb Jr.—p. 21.
Familial Pattern in Peptic Ulcer: Report of Family and Review of Literature. E. Wasserman and M. Ringer.—p. 23.
Perforation of Fish Bone Through the Duodenum into Portal Vein Resulting in Streptococcus Septicemia and Death. A. Widome.—p. 25.

New England Journal of Medicine, Boston

246:77-114 (Jan. 17) 1952

*Therapeutic Dermatitis. C. G. Lane.—p. 77.
Prevalence of Psychiatric Illness in a Medical Out-Patient Clinic. B. H. Roberts and N. M. Norton.—p. 82.
Hypervitaminosis A: Case Report. J. F. Naz and W. M. Edwards.—p. 87.
Vivax Malaria in Veterans of the Korean War: Preliminary Report of 25 Cases. W. H. Hall and G. W. Loomis.—p. 90.
Use of ACTH and Cortisone in Dermatology. J. G. Downing.—p. 94.

"Therapeutic" Dermatitis.—"Therapeutic" or "overtreatment" dermatitis is becoming a major problem. Comparatively few of such conditions are caused by primary irritants, that is, those substances that would produce an eruption on contact with most skins, but are generally due to sensitization. In one series of cases of therapeutic dermatitis that were reviewed before the penicillin era, 70% were caused by sulfonamides, 10% by mercury, and the other 20% by unknown agents. In another series 35% were caused by drugs of the sulfonamide group. The sensitizing effects of these drugs are now better known and so they are not so often used for local application. Many cases of poison ivy dermatitis are exaggerated with injections of poison ivy extracts. It is now believed that these extracts should not be used for therapy, although they may be of value in prevention. The majority of cases of so-called "athlete's foot" are complicated by dermatitis produced by substances applied to remedy the original condition. Whereas the normal skin withstands ordinary chemical contacts, a skin stripped of its protective layers, particularly a skin already inflamed by chemical agents, is easily irritated. Agents or vehicles that alter the normal pH of the skin, change or remove the lipoid coating, damage the horny layer, or react with one another may enhance the sensitization. Mercury and salicylic acid together may produce a severer reaction than a stronger application of either of these chemicals alone. Therapeutic dermatitis often results when chemicals are applied for minor scratches, cuts, or burns. Physicians should caution their patients to be careful in self-treatment, and to avoid patent and proprietary agents of unknown composition and those advised by family, friends, or druggist. The first factor in treatment is identification and elimination of the causal chemicals. Omission of the sensitizing agents and application of a calamine lotion may be sufficient in mild cases. A lotion is usually better than an ointment in early cases. A fixed formula often fails, and it is essential to consider the age and type of skin, the location, the severity of manifestations, and previous applications.

Texas State Journal of Medicine, Fort Worth

48:1-60 (Jan.) 1952

Peripheral Vascular Disease: Conservative Medical Management. H. E. Heyer.—p. 7.
Alpha-Tocopherol and Calcium Gluconate in Prevention of Thrombo-Embolism: Preliminary Report. W. E. Crump and E. F. Heiskell Jr.—p. 11.
Prolonged Anticoagulant Therapy for Ambulatory Patients. B. B. Elster and H. B. Eisenstadt.—p. 14.
Clinical Pathology of Multiple Myeloma. W. N. Powell.—p. 18.
Amebiasis: Common Clinical Problem. T. H. Harvill.—p. 24.
Treatment of Pinworms (Oxyuriasis); Clinical Evaluation Based on 1,005 Cases. W. P. Killingsworth, P. R. Meyer, J. M. McFadden and H. L. Boardman.—p. 27.
Management of Burns in Children: Newer Concepts. F. A. Garbade and T. G. Blocker Jr.—p. 32.
Letterer-Siwe's Disease: Report of Case in Infant. G. T. O'Byrne.—p. 35.
Extragenital Granuloma Venereum: Report of Case Without Associated Pudendal Lesion. D. S. Morris and G. E. Bennack.—p. 39.

Virginia Medical Monthly, Richmond

79:1-62 (Jan.) 1952

Antihistaminics. H. B. Haag.—p. 8.
Anemia. K. D. Graves.—p. 12.
Treatment of Intestinal Obstruction with Air-Vent Tube. J. W. Devine, J. W. Devine Jr., S. W. Burwell and others.—p. 17.
Practical Management of Alopecia. R. J. Fields.—p. 20.
Administration of Potassium to Surgical Patients in a 150 Bed Hospital. H. A. Albertson and H. H. Trout Jr.—p. 25.
Geriatrics Unlimited. J. P. Lynch.—p. 29.
Multiple Osteochondromata of Hand: Report of Case. B. H. Kyle.—p. 36.
Eosinophilic Granuloma of Skull: Report of Four Cases of Benign Bone Lesion. J. M. Meredith and W. T. Price Jr.—p. 38.
Electro Shock Therapy—Central State Hospital. M. S. Brent and R. W. O'Gorman.—p. 44.

FOREIGN

British Heart Journal, London

14:1-152 (Jan.) 1952

Regulation of Blood Pressure Levels by Hexamethonium Bromide and Mechanical Devices. P. A. Restall and F. H. Smirk.—p. 1.
Complete Transposition of Great Vessels. R. Astley and C. Parsons. —p. 13.
*Pathology of Pulmonary Heart Disease. F. McKeown.—p. 25.
Electrokymography—Preliminary Studies. L. G. Davies and G. R. Venning.—p. 33.
Movement of Aortic and Pulmonary Valves Studied Post Mortem by Colour Cinematography. I. K. R. McMillan, R. Daley and M. B. Matthews.—p. 42.
Pulmonary Capillary Arterial Pressure Pulse in Man. W. Weissel, F. Salzmann and H. Vetter.—p. 47.
*Constrictive Pericarditis. W. Evans and F. Jackson.—p. 53.
Rheumatic Fever in Young Adults. W. T. Zimdahl.—p. 70.
Dihydrogenated Alkaloids of Ergot in Investigation and Treatment of Diastolic Hypertension. D. F. Gibbs.—p. 77.
Aneurysm of Coronary Arteries. A. I. D. Prentice and J. B. Penfold. —p. 87.
Exercise Test in Intermittent Claudication. L. McDonald and R. Semple. —p. 91.
*Role of Nervous System in Maintenance of Venous Hypertension in Heart Failure. D. Halmágyi, B. Felkai, J. Iványi and G. Hetényi Jr.—p. 101.
Clinical Electrocardiography: Three-Dimensional Visual Aids to Teaching. T. J. Rankin and E. G. Dimond.—p. 112.
Heart in Haemochromatosis. W. G. A. Swan and H. A. Dewar.—p. 117.
Cardiogram in Ventricular Aneurysm Following Cardiac Infarction. T. East and S. Oram.—p. 125.

Pathology of Pulmonary Heart Disease.—In 6,770 routine postmortem examinations, 111 cases of right ventricular hypertrophy secondary to diseases of the lungs were found. Emphysema was the commonest cause. Three subgroups of cases were distinguished in which the absence of morphological lesions in the lung parenchyma suggested that increased blood pressure was due to changes in the vascular tree itself. Group 1 was comprised of 11 cases in which an obvious obstructive lesion of the pulmonary vascular system accounted for the changes in the heart, namely, 4 of pulmonary arteritis, 2 of tumor embolism, and 5 of chronic pulmonary embolism. Group 2 consisted of four cases in which pulmonary hypertension or right ventricular hypertrophy occurred in the absence of any demonstrable histological lesion in the pulmonary vascular system or parenchyma. These were considered as examples of primary pulmonary hypertension. Group 3 consisted of all cases of emphysema, which was associated with right ventricular hypertrophy in 39 cases. Although attempts were made to correlate the right ventricular hypertrophy with vascular lesions in the lungs, comparison with necropsy findings in cases without chronic disease of the heart or lungs showed that the lesions observed in the small vessels conform to normal changes of the pulmonary vascular system and therefore could not be considered as the morphological basis for the cardiac hypertrophy.

Constrictive Pericarditis.—Of 30 patients between 11 and 63 years of age with constrictive pericarditis who submitted to the operation of cardiac decompression, 25 were alive after follow-up observation for 6 months to 13 years. Six were somewhat improved by cardiac decompression, but were considered therapeutic failures since they required digitalis and mercurial diuretics for control of fluid retention. One patient resumed his work as a window dresser six months after surgical intervention, but the follow-up period is still too short to permit definite conclusions. The remaining 18 patients who have already survived the operation for an average period of five years were greatly benefited and follow their customary occupations without complaints. The authors believe that constrictive pericarditis is the outcome of a tuberculous infection. Generally the infection was confined to the pericardium except for slight involvement of the pleura. Surgical intervention should be delayed in patients with evidence of tuberculosis in areas other than the pericardium. Symptoms and signs of constrictive pericarditis, and electrocardiographic changes are discussed. Roentgenologic examination of the heart proved an indispensable corroborative diagnostic test. Calcification of the heart was present in 20 patients. A liver biopsy was carried out in seven patients. In three the specimen obtained was inadequate; in three others there was fibrosis and in one there was much central congestion without fibrosis. The common occurrence of congestive cirrhosis in constrictive pericarditis makes liver biopsy important, but the procedure is difficult and the uncertainty of securing an adequate specimen obviates routine use. In patients with constrictive pericarditis of long duration who have ascites and considerable enlargement of the liver, biopsy is important to determine whether the hepatic fibrosis is severe enough to preclude any benefit from cardiac decompression. The authors emphasize the value of surgical treatment when performed early and before the development of irreparable liver damage. Without surgical treatment the patient will become a hopeless invalid.

Venous Hypertension in Heart Failure.—The role of the central nervous system in maintaining venous hypertension was studied in 84 men and women, of whom 62 had chronic congestive heart failure. None of them received any treatment or sedative prior to the experiments that were carried out in the early morning hours, at least eight hours after the intake of the last meal. Ergotamine derivatives and sodium nitrite were administered to study the influence of substances effecting the smooth muscle of the vascular system and m-oxyphenyl-isopropyl-amine was given to study the effect of a sympathomimetic agent. Tetraethylammonium bromide, atropine sulfate, and N,N-dibenzyl-β-chloroethylamine (dibenamine®) hydrochloride were given to bring about ganglionic, sympathetic, and parasympathetic blocking on venous pressure. The substances were administered by a slow intracardiac or intravenous infusion by means of an electric pressure pump. Prior to and following all procedures, cardiac output and pressures were repeatedly determined. Additional experiments were carried out on male and female unanesthetized dogs. Results showed that ergotamine derivatives caused a rise in peripheral and central venous pressure in man, but not in animals. Sodium nitrite decreased the right atrial pressure in patients with heart failure, but not in normal persons. Contraction or relaxation of the walls of the veins seems to result in a rise or decrease in venous pressure. Venous hypertension in heart failure is partly due to a constriction of the small veins. Venous constriction in heart failure is mediated by the sympathetic nervous system and controlled by higher brain centers. As in benign arterial hypertension, in venous hypertension there is also a "common neurogenic component." Venous pressure elevation in dogs given large intravenous infusions of isotonic sodium chloride solution did not decrease following administration of tetraethylammonium bromide. It was concluded that expanding blood volume does not create conditions identical with human heart failure. High venous pressure in heart failure results from a combination of a mechanical factor, such as high blood volume or back pressure, and a functional factor, such as nervously produced venous constriction.

British Journal of Surgery, London

39:193-288 (Nov.) 1951

Local Recurrences After Sphincter-Saving Excisions for Carcinoma of Rectum and Rectosigmoid. J. C. Goligher, C. E. Dukes and H. J. R. Bussey.—p. 199.
Contribution to Principles of Surgery of Inguinal Hernia. A. J. H. Rains. —p. 211.
Proximal Approach to Oblique Inguinal Hernia. D. S. Quill.—p. 226.
Posterior Wall of Inguinal Canal. M. J. Blunt.—p. 230.
Cicatrizing Enterocolitis. G. Lumb.—p. 233.
Giant Hypertrophic Gastritis Simulating Malignant Disease. R. T. Grime and R. Whitehead.—p. 244.
Case of Eosinophilic Gastritis. I. Doniach and K. C. McKeown.—p. 247.
Gastric Neurilemmoma. J. A. Baty.—p. 251.
Cyst Formation in Relation to Stomach and Oesophagus. R. C. Shaw. —p. 254.
Reticulosarcoma of Thyroid Gland. A. Dick and H. S. Kellett.—p. 257.
Case of Congenital Capillary Haemangioma of Parotid Gland. R. A. Caldwell.—p. 261.
*Results of Surgery for Bronchiectasis. J. T. Chesterman.—p. 263.

Surgery for Bronchiectasis.—In 114 consecutive lobectomies and segmental resections of the lung performed on 106 patients between the ages of 2½ and 47 years with bronchiectasis, the two tourniquet method was used in 59, dissection in 55, and both methods in 7 cases of multiple resections. Dissection is indicated unless speed is essential, that is in small children, in patients who are bad risks, and in the presence of operative or anesthetic difficulties. There were two operative deaths and in both patients the disease involved both lungs. Five deaths occurred six months to three years after the surgical intervention; three were attributable to the chest condition, one of which was an operative failure. Four patients were unchanged. Twelve patients were improved, i. e., they resumed their normal occupations, but some disability was still present. Good results were obtained in 77 patients, while 6 were improved and awaited further surgery. Operative mortality now appears to be due almost entirely to avoidable errors of judgment. Later mortality depends on the number of cases in which operation is performed for bilateral and diffuse disease, and is probably avoidable in cases in which it is unilateral. Postoperative lack of expansion of the lung is due to the following factors: tracheobronchitis and bronchial obstruction, pleural fluid, whether serous or purulent, bronchopleural fistula, pulmonary edema, and infection. Several of these factors usually occur, and it is frequently impossible to separate them from each other, though one factor usually predominates in initiating the condition. Pleural fluid and tracheobronchitis appear to be the most important. In 10 patients bronchiectasis recurred within 24 months of the original operation. Recurrent bronchiectasis is caused by fibrosis following edema and infection of the area involved. The precipitating factors are bronchial, vascular, and lymphatic obstruction, except in rare cases in which acute infection or neuromuscular incoordination may initiate the process. Collapse and pneumonitis of the opposite side and congenital abnormalities observed at operation do not increase postoperative mortality. Lobectomy and segmental resection offer relief in some cases of diffuse bronchiectasis, they are of increasing value in bilateral cases, and the 90% success of surgical intervention for unilateral disease can hardly be excelled in any other field of surgery.

Canadian Medical Association Journal, Montreal

66:95-210 (Feb.) 1952

Cerebral Fat Embolism: Unusual Case with Recovery. J. Kershman and F. Haddad.—p. 95.

*Follow-Up Study of Juvenile Diabetics. R. B. Kerr, G. D. Brown and N. Kalant.—p. 97.

Present Status of Deficiency States. C. J. Barborka.—p. 105.

Evaluation of Newer Techniques in Surgical Scrub. E. Harrison and W. H. Cockcroft.—p. 110.

Diagnosis and Surgical Management of Gall Stone Ileus. R. M. Levine and C. B. Ripstein.—p. 113.

Advances in Colon and Rectal Surgery. A. O. Whipple.—p. 116.

Post Traumatic or Infectious Localized Serous Meningitis or Subdural Hygroma. J. Sirois.—p. 121.

Heart Disease and Mass Miniature Radiography. M. I. Bostock and W. Morris.—p. 126.

Costobrachial Syndrome. J. C. Luke.—p. 127.

Spontaneous Abortion—Diagnosis and Treatment. C. L. Randall and P. K. Birtch.—p. 132.

*Chronic Friedlander's Pneumonia. H. Z. Pomerantz and E. Wasserman. —p. 137.

Outbreak of Epidemic Influenza at Camp Borden, Ontario. G. Dempster, D. O. Coons and B. K. Buchner.—p. 140.

Carcinoma of Bladder: Results of Total Cystectomy. F. H. Colby. —p. 144.

Malignant Haemangioendothelioma of Heart. A. J. Blanchard and H. Hethrington.—p. 147.

Experiences with Terramycin in Urinary and Genital Tract Infections. P. R. Blahey.—p. 151.

Anaesthesia for Fenestration. M. B. Shea and B. W. Tanton.—p. 154.

Sacro-Iliac Joints: Observations on Gross and Histological Changes in Various Age Groups. G. R. Macdonald and T. E. Hunt.—p. 157.

Juvenile Diabetes.—A follow-up was made of 81 patients in whom diabetes had appeared before the age of 16, lasting in some as long as 28 years. All but 3 had been treated entirely during the insulin era, and 36 had had a hereditary and/or familial history of diabetes. The diabetes was considered well controlled in 32 patients who came closest to attaining normal physiological conditions during the entire period of the disease, while in 49 there was evidence of poor diabetic control. Retinopathy was present in 12 well controlled patients, cardiac disease in 1, renal disease in 2, vascular calcification in 2, neuropathy in 1, and cerebral damage in 1. Early and more frequent complications were found in the poorly controlled patients, with retinopathy in 29, cardiac disease in 6, renal disease in 9, vascular calcification in 11, neuropathy in 7, skin lesions in 8, and other diseases in 2. After 15 or more years of diabetes, 6 of the well-controlled patients as compared to 2 of the 28 poorly controlled patients showed no clinical evidence of degenerative changes. Of the 10 well-controlled patients who survived 20 years of diabetes, 4 were free from complications, whereas complications were present in all the 28 poorly controlled patients who survived the same length of time. Adequate diabetic control was also important in assuring the birth of living children. Of 10 children born to mothers of the first group, 9 are still living, while of the 13 children born to mothers of the second group, only 2 are living. The rate, severity, and early onset of complications increase as the degree of diabetic control decreases. Normal physiological conditions rather than mere freedom from symptoms should be one's aim in treating juvenile diabetes.

Chronic Friedländer's Pneumonia.—Four cases of chronic pneumonia due to Friedländer's bacillus are reported, and the course, diagnosis, and beneficial effects of combined antibiotic and surgical treatment are discussed. On the basis of individual chest roentgenograms, in two cases the diagnosis was pulmonary tuberculosis despite the presence of Friedländer's bacillus in the sputum culture. But a review of serial roentgenograms showed clearly that the pneumonic process of the lobes had progressed to multiple abscesses and cavitation. In one patient after the infection was controlled with prolonged administration of chloramphenicol (chloromycetin®) streptomycin, and sulfadiazine, lobectomy to remove the residual cavitation of the right upper lobe was successful. In another patient, who was seen before the newer antibiotics became available, lobectomy could not be performed because the antibiotic control was inadequate, and the patient died 10 months after hospitalization. Because this disease is easily confused with coccidioidomycosis and especially pulmonary tuberculosis, studies of serial chest roentgenograms and sputum cultures are of the utmost diagnostic importance. Death rate due to acute Friedländer's pneumonia has decreased since the advent of the newer antibiotics, and may be further diminished with the combined use of these antibiotics and surgery.

Deutsches medizinisches Journal, Berlin

3:1-48 (Jan. 15) 1952. **Partial Index**

*Treatment of Intracranial Aneurysms. W. Tönnis.—p. 1.

So-Called Antihistamine Drugs in Clinic and Practice. G. A. Rost.—p. 4.

Parenteral Therapy with Calcium, Cysteine, and Ascorbic Acid. H. Kienle.—p. 9.

Treatment of Intracranial Aneurysms.—Of 45 patients with surgically treated intracranial aneurysms, 10 had ligature of the carotid artery in the neck for aneurysm of the internal carotid artery and all survived the operation. In 10 additional patients with aneurysm of the internal carotid artery intervention consisted of intracranial exclusion of the aneurysm with silver clips applied in front and behind the aneurysm; one of these patients died from secondary hemorrhage. Direct intracranial intervention combined with ligation of the carotid arteries in the neck was performed on nine patients with aneurysm of the internal carotid artery, and one died. Direct intracranial intervention was performed on the remaining 16 patients, 1 with aneurysm of the ophthalmic artery, 5 with aneurysm of the anterior cerebral artery, 2 with aneurysm of the anterior communicating artery, 4 with aneurysm of the middle cerebral artery, and 2 each with aneurysm of the posterior communicating artery and vertebral artery, respectively. Intracranial exclusion of the aneurysm was combined with simultaneous resection of the cervical sympathetic nerve to check axon reflexes. As a rule, treatment of aneurysm of the anterior communicating artery consists only of reinforcing the arterial wall by surrounding it with small muscle pieces. Aneurysm of the posterior communicating artery may be treated by exclusion of the aneurysm with silver clips applied in front and behind the aneurysm. Four of these 16 patients died. Of the 45 patients operated on, 6 died, a mortality rate of 13.3%; the mortality rate was 17.1% in the 35 patients who submitted to intracranial intervention. Compared with the results reported in the literature, the author's results are favorable; two-thirds of the patients with the apoplectic type and all the patients with the paralytic type of intracranial aneurysm survived. Since precise localization of intracranial aneurysms has become possible by clinical examination combined with arteriography, in every case the possibilities of surgical intervention to exclude the source of bleeding should be considered. Adequate collateral circulation is necessary for surgical intervention, and consequently arteriograms of the contralateral internal carotid and vertebral arteries are indispensable.

Giornale di Clinica Medica, Parma

32:1081-1204 (Oct.) 1951

Velocity of Circulation, Sedimentation Rate, Coagulation and Bleeding Time, and Capillary Fragility in Old Age. L. Gipperich and S. Lo Bianco.—p. 1081.
Number and Formula of Leukocytes in Healthy Adults from Sicily. G. Cali'.—p. 1111.
*Treatment of Breast Cancer: Synthetic Review and Experiences at Radiology Institute of University of Parma. T. Braibanti and G. Prevedi.—p. 1123.

Treatment of Breast Cancer.—After review of the literature on this subject, the authors conclude that the best curative measure is radical surgical removal of the tumor based on early diagnosis and classification of the tumors as operable and inoperable according to the extent and type of growth of the cancer. Irradiation is a palliative measure and is used preoperatively and/or postoperatively. Preoperative roentgen therapy is not used often because the surgeon objects to delaying the operation. Postoperative roentgen therapy is used widely, especially in patients with advanced axillary metastasis. In inoperable cases administration of divided doses of roentgens at low voltage and weak filtration gives good results. Hormone therapy and castration are effective on bone metastasis, and radiological castration is the method of choice. However, endocrinotherapy and its practical application have not been studied completely. The authors report on 380 patients who were treated postoperatively at the Radiology Institute of the University of Parma from 1935 to 1948. Primary cancer was present in 237 patients and recurrences with metastasis to the lymph nodes in 143. Cancer was more frequent in 152 menopausal women over 45 years of age. Postoperative roentgen therapy was begun 20 to 30 days after the intervention, and consisted of a total of 5,000 to 6,000 r administered in doses of 250 to 300 r daily. The anterior area, from the sternum to the axilla, received a total of 2,500 to 3,000 r; the supraclavicular area and a posterior area, including the scapular region and the axilla, received 1,000 and 1,500 r, respectively. Of these patients 112 were not followed. In the others the mortality rate was higher in the 2 years following treatment, decreasing after 5 and 10 years. The survival rate in patients less than 45 was 28.2%, 17%, and 10.7% after 3, 5, and 10 years, respectively, as compared to a survival of 52.2%, 41.2%, and 29.2% in patients over 45. Results of treatment of mammary carcinoma are still far from encouraging, and much more work on the problem is needed.

Journal of Laryngology and Otology, London

66:1-54 (Jan.) 1952

Semon Lecture: Articulatory Defects in Aphasia. M. Critchley.—p. 1.
Osteomyelitis of Maxilla. R. Macbeth.—p. 18.
Endocrines and Nose. E. Watson-Williams.—p. 29.
Nuclear Jaundice and Deafness. J. Gerrard.—p. 39.

Lancet, London

1:167-220 (Jan. 26) 1952

Acute Infections of Fingers and Hand. D. Bailey.—p. 167.
Factors Influencing Rate of Healing of Gastric Ulcers: Admission to Hospital, Phenobarbitone, and Ascorbic Acid. R. Doll and F. Pygott.—p. 171.
Size of Follicles in Non-Toxic Goitre. S. Taylor.—p. 175.
Effect of Mephenesin in Spastic Paralysis. D. R. Laurence.—p. 178.
Metabolic Effects of Total Pancreatectomy in Man. A. G. W. Whitfield, A. Gourevitch and G. Thomas.—p. 180.
Effect of Adrenocorticotropic Hormone• on Clinical and Experimental Haemolytic Anaemia. K. P. Clearkin.—p. 183.
Haemopoietic Effect of Vitamin B_{12} Prepared from Fish. K. Hausmann and K. Mulli.—p. 185.
Haemothorax Following Artificial-Pneumothorax Refills. W. E. Mashiter.—p. 188.
Gross Amino-Aciduria Following Lysol Burn. A. G. Spencer and G. T. Franglen.—p. 190.
Agranulocytosis During Treatment with Diethazine Hydrochloride. G. C. Heller and D. A. Sime.—p. 192.

Lyon Chirurgical

47:1-128 (Jan.) 1952. Partial Index

Denervation of Hip Joint. A. Trillat and R. Lacour.—p. 1.
Experimental Study of Hepatic Flora in Human Subjects. C. Romieu and A. Brunschwig.—p. 11.
Primary Hyperostosis of the Cranium: Observations on 8 Cases. P. Wertheimer and P. Milleret.—p. 18.
Action of Thyroxin on Course of Experimental Fractures in Dogs. R. Fontaine, A. Chevallier, M. Klein and others.—p. 23.
Postoperative Pubic Osteitis: Study of 20 Cases. J. Cibert, L. Durand and J. Collenet.—p. 37.
*Utilization of Heterogenous Frozen Bone in Human Subjects. M. Guilleminet, P. Stagnara, T. Dubost-Perret and others.—p. 57.

Heterogenous Frozen Bone in Human Surgery.—A human bone bank is of great importance in bone surgery, but it is sometimes difficult to obtain a sufficient supply of preserved human bone. When J. and R. Judet in 1949 reported that they had used frozen bone of calves in surgical interventions on human beings, the authors decided to try this same material. The Judets had suggested that refrigeration at extremely low temperatures produces modifications in the osseous tissue, which in some manner takes away its species specificity. The authors first experimented with frozen calf bone in 15 dogs and 12 guinea pigs, and then used the heterologous material in man. In May, 1951, they were able to evaluate 80 calf bone grafts in human subjects, which they review in this paper. Compact bone was used in 43 of these cases and spongy bone in 37. By far the greatest number of bone grafts were performed for fixation of the spine, some for pseudarthrosis of the extremities and in other cases bone defects, such as cysts, tumors, or cavities, had to be filled with bone tissue. The results were unsatisfactory in only eight cases, two of scoliosis, one of lumbosciatic disease, two of pseudarthroses, one in which arthrodesis was done, and two in which cavities were filled. Tolerance was about the same for frozen heterogenous bone as for autogenous bone grafts.

Medical Journal of Australia, Sydney

1:25-56 (Jan. 12) 1952

Psychiatric Facts and Fantasies. J. F. Williams.—p. 25.
Endemiology in Family Practice. H. Shannon.—p. 30.
Fatal Stings to North Queensland Bathers. H. Flecker.—p. 35.
Chemotherapy in Reticuloses. R. A. Melick.—p. 38.
Limitations of Graham's Test in Examination of Gall-Bladder. D. G. Maitland.—p. 43.

1:57-96 (Jan. 19) 1952

"Memini Praeteritorum, *Futura Praeuideo.*" K. B. Fraser.—p. 57.
Recent Trends in Aviation Medicine Abroad. E. A. Daley.—p. 61.
Phenylpyruvic Oligophrenia, with Notes on New Case and Report of Laboratory Investigations in Earlier Case. S. J. Cantor.—p. 69.
Student Training in Personal Relationships Between Doctor and Patient. S. D. Rubbo and P. Gladwell.—p. 71.

Medicina Clínica, Barcelona

17:275-348 (Nov.) 1951. Partial Index

Pathogenetic Bases for Treatment of Arterial Hypertension. J. Gibert-Queraltó.—p. 275.
Hanot's Disease and Treatment with Lipotropic Factors. J. Solsona Conillera.—p. 290.
*Stomatitis from Streptomycin. N. Nadal-Valldaura.—p. 309.
*Use of Rectal Route in Treatment of Migraine. R. Frouchtman.—p. 311.
Present Treatment of Suprarenal Insufficiency. C. Pérez Vitoria.—p. 312.

Stomatitis Caused by Streptomycin.—Streptomycin causes edema of the lips, small superficial ulcerations on the labial mucosa, tip of the tongue, and inside of the cheeks, a whitish coating over part of the buccal mucosa, and violent redness of the tongue, lips, and gums. The roof of the palate may also be involved. These lesions in various combinations appear some time after treatment with streptomycin is begun, disappear when it is discontinued, and reappear if it is resumed. The pathogenesis of this stomatitis is not clear; toxic and allergic factors have been suggested as its cause, and both together may be responsible. Its frequency is diminished when doses are not too high and when dihydrostreptomycin, which seems less toxic than other forms, is used. Sensitivity of the buccal mucosa to the various streptomycin salts should be determined before treatment is begun by means of a testing cup attached to a tooth, since skin tests are not always satisfactory.

Use of Rectal Route in Treatment of Migraine.—Caffeine and ergotamine with acetylsalicylic acid taken orally proved effective in aborting attacks of migraine. One tablet containing 0.002 gm. of ergotamine tartrate, 0.11 gm. of caffeine, and 0.25 gm. of acetylsalicylic acid was usually sufficient; if necessary, another tablet was taken an hour later. Larger doses may give rise to gastric disturbances, but these may be avoided by rectal administration, which brings the medication into contact with a mucosa of large absorptive capacity and results in its entrance into the vena cava and the general circulation. The time required for the drug to take effect is short, approximating that of subcutaneous injections. The action of the gastric juices and the hepatic barrier are avoided, eliminating gastric disturbance. Fourteen patients with migraine have been treated with rectal suppositories containing 0.002 gm. of ergotamine tartrate, 0.11 gm. of caffeine, and 0.1 gm. of aminopyrine (pyramidon®) in a suitable base. Headache disappears within half an hour, and the patients remain symptom free for several days. Failure occurred in only one case of the endocranial type, which is generally resistant to symptomatic therapy. .

Minerva Medica, Turin

42:1037-1068 (Dec. 15) 1951

Errors and Inefficiencies of Radiodiagnosis of Pulmonary Cavities. G. Luzzatti and B. Perotti.—p. 1037.
Longitudinal Tomography of Esophagus in Oblique Right Anterior Projection. G. Guglielmini and D. A. Scala.—p. 1044.
Contribution to Study of Renal Hemodynamics in Patients with Heart Disease by Means of Selective Tests of Renal Functions. O. Mantero and G. Barlassina.—p. 1049.
*Application of Carotid-Sinus Pressure in Diagnosis. L. Marzocchi and G. Pisani.—p. 1058.

Carotid-Sinus Pressure in Diagnosis.—The authors studied the diagnostic application of pressure on the carotid sinus in 50 patients with various allergies and nervous imbalance who had no abnormality of the carotid sinus. Eight patients were of the "torpid" type or quiet and balanced persons, 12 were of the "intermediate" type, 23 of the "labile" type or unusually excitable persons, and 7 were of the "pathological" type or persons with pathological disturbances of the nervous system. The pressure, applied simultaneously to both sinuses of the patient in the standing position, aroused reactions that were divided into the following four phases: (1) mydriasis, with paresthetic sensations of the upper and lower extremities; (2) hypotension, bradycardia, and dizziness; (3) complete loss of energy, arrest of pulse beat, and apnea lasting as long as 20 seconds; and (4) loss of consciousness, with eventual epileptiform attacks. These symptoms regressed 20 seconds to 1 minute after the compression was stopped. The fourth stage was reached easily and quickly by the "labile" person, whereas in the "torpid" person the reaction was interrupted at the first or second stage. Since persons of the same nervous type reacted to compression of the carotid sinus constantly in the same way, the authors suggest that this technique may become a valuable adjuvant in diagnosis.

New Zealand Medical Journal, Wellington

50:537-634 (Dec.) 1951

Present Scope of Cardiac Surgery. E. M. Nanson.—p. 537.
Sexual Precocity. H. R. Donald.—p. 552.
Two Unusual Vulval Tumours. J. L. Wright.—p. 560.
Causes of Failure in Breast Feeding. H. E. W. Robertson.—p. 566.
Tracheal Obstruction in Infancy Due to Angioma. I. M. Rutherford and A. W. Sutherland.—p. 570.
Epidemic of Atypical Pneumonia. S. R. West.—p. 571.
*Comments on Death and Resuscitation After Electric Shock in New Zealand. T. O. Garland.—p. 579.
Epileptic Automatism. I. M. Allen.—p. 585.
Cancer of Colon, with Emphasis on Its Recognition in General Practice. E. H. W. Gifford.—p. 599.
Congenital Atresia of Oesophagus. A. W. Sutherland.—p. 603.
Stitch: Side Pain of Athletes. J. D. Sinclair.—p. 607.

Death and Resuscitation After Electric Shock.—The degree of shock produced by an electric current is influenced by length of contact, strength of current, parts of the body through which the current passes, and other factors. Garland emphasizes that many electric shock victims, like the apparently drowned, may be revived by artificial respiration. A New Zealand report mentions 10 successful attempts to revive men after a shock severe enough to produce unconsciousness; a report from Great Britain described 102 such cases in the years 1944-1948 and Jellinek in a recent book reports 12 cases. In these reports the longest interval between shock and returning consciousness was 90 minutes. However, the author cites a Canadian report in which recovery occurred after continued application of efficient prone pressure resuscitation for eight hours. A study of the inquest reports of victims of electric shock indicates that a fatal shock does not always produce death or even unconsciousness immediately. Garland believes it is possible that the resistance of the tissues causes a rise in temperature and that the man who is able to talk and then vomits and then passes into unconsciousness is the victim of a heat stroke, with paralysis of the respiratory center. When electric shock acts directly on a heart, it may produce fibrillation or complete arrest. A number of observers suggest that the heart may merely be jarred into beating very feebly and irregularly. Jellinek stressed that in cases of apparent death after electric shock imperceptibility of heart activity is characteristic, and he insists that artificial respiration should be continued for a number of hours. Cardiologists know that inaudibility of heart sound is not necessarily incompatible with life. The opinion expressed by some pathologists that, if the heart sounds could not be heard with a stethoscope for 10 minutes, there was no possibility of revival, is therefore challenged by the author. It is advisable to continue artificial respiration after electric shock for two hours after all signs of life have ceased. In some cases in which a fall is associated with the severe electric shock, some method of artificial respiration other than prone pressure should be applied. It would add to our knowledge if an electrocardiogram were taken in any case of apparent death from electric shock when the patient is admitted to the hospital.

Nordisk Medicin, Stockholm

46:1867-1922 (Dec. 19) 1951

*Reiter's Syndrome. L. Nyfos.—p. 1868.
Effect of *p*-Aminosalicylic Acid Treatment on Mortality After Thoracoplasty in Pulmonary Tuberculosis. S. Lundberg.—p. 1871.
Prepartal Diagnosis of Anencephalus. E. Gustavsson.—p. 1874.
Surgical Treatment of Anal Incontinence. B. Snellman.—p. 1874.
Mongolism and Heredity. S. Lahdensuu.—p. 1877.

Reiter's Syndrome.—Nyfos discusses seven cases of Reiter's syndrome in men from 20 to 43 years of age who were treated during the last 10 years, four of them in 1950. One patient was readmitted during the period because of recurrence. On admission five patients presented the full symptom complex of urethritis, conjunctivitis, and polyarthritis, one patient had symptoms from the eyes and urinary tract, and two patients had symptoms referable to the joints and urinary tract. The more severely ill patients with generalized symptoms seemed to be those with the entire symptom triad. Two patients also had stomatitis, one had a hyperkeratotic skin eruption, and one had myocarditis. Cases with two symptoms of the triad or in which the third symptom is transitory are considered as more or less abortive. A tendency to recur was observed. Complete recovery was usual, although in the typical cases with polyarthritis the course was long-continued. The patient generally seeks medical care for the joint symptoms. Since the etiology and pathogenesis are uncertain, no adequate causal therapy has been possible. The varied picture in the cases described led the author to suggest that the disease may represent allergic phenomena, possibly on different etiological bases.

Policlinico (Med. Sect.), Rome

58:357-420 (Dec.) 1951

*Icterus in Leptospiral Icterohaemorrhagica: Its Characteristics and Pathogenesis. M. Austoni and L. Treu.—p. 357.
Behavior of Blood Calcium and Potassium after Intradermal Administration of Penicillin. A. La Maestra.—p. 401.
Unsaturated Fatty Acids: Biochemistry and Therapeutic Applications. II. Experiments with Vitamin F 99. M. Finzi.—p. 408.
Id.: III. Vitamin F, Essential Factor. M. Finzi.—p. 416.

Jaundice in Weil's Disease.—Jaundice in spirochetal hepatitis was studied in 143 patients, in most of whom the infection had developed after swimming in infected waters. Jaundice had appeared from the second to the ninth day of the disease in 67 patients. The characteristic orange color was also present in the internal organs and the body fluids. Itching was present only in the patients with jaundice, whereas bradycardia was observed in all the patients and was attributed to the bradycardic action of bacterial toxins. Temperature and urobilinuria were proportional to the severity of jaundice. Constipation revealing poor function of the liver and probably of the pancreas was present when jaundice was severest. Bile excretion was greatly decreased during the initial phase of jaundice and increased during the period of remission. There was a positive, immediate, and biphasic reaction to the direct van den Berg test, and the indirect van den Berg test showed hyperbilirubinemia. The jaundice in Weil's disease may be attributed to an inflammatory degenerative hepatocellular lesion that is responsible for retention of modified and unmodified bilirubin. Bile stasis and increased hemolysis may be contributing factors. The former is evident in the marked diminution or absence of biliary secretion attributable to stasis of the biliary pigment at the level of the biliary capillaries, rather than to hepatocellular lesion and functional insufficiency. This stasis is more pronounced in patients with Weil's disease, as shown by fecal acholia in 47% of the patients, hypocholia in 33%, and the high levels of stercobilin in periods of remission. Increased hemolysis that is responsible for the increased bilirubin is attributed to the biological activity of the Leptospira icterohaemorrhagiae and the organism's reaction to it. The excessive quantity of stercobilin excreted at remission of jaundice probably originates not only from retention of the pigment but also from increased production of it before it enters the liver. Anemia of the hypochromic type, pronounced inflammatory degenerative alteration of the muscle tissue, and hyperazotemia observed in these patients with Weil's disease are discussed. A hypothesis is advanced that the process of disintegration of the muscle tissue with release of myoglobulin may be important in determining not only hyperazotemia but also hepatic insufficiency, thus contributing to the genesis of jaundice.

Presse Médicale, Paris

60:41-60 (Jan. 16) 1952. **Partial Index**

*Surgical Applications of in Vitro Heparin Tolerance Test. J. Witz and *A.-M. Stuber.—p. 45.*
Artificial Kidney, a New Apparatus and a New Technique. L. Bartrina.—p. 48.
Fatal Hypoglycemic Coma Due to Insular Adenoma of Pancreas. A. Luisi.—p. 51.

Surgical Applications of in Vitro Heparin Tolerance Test.—During the last two years Witz and Stuber have used a modified Waugh and Ruddick test for increased coagulability of blood in vitro combined with Quicks' prothrombin time test and the determination of the amount of prothrombin in the blood for prevention, diagnosis and treatment of postoperative phlebitis. As a rule the appearance of venous thrombosis was associated with hyperprothrombinemia and increased coagulability. Sometimes the amount of prothrombin in the blood was normal, but the heparin tolerance curve fell below normal limits, indicating an accelerated coagulation. In rare cases the blood prothrombin level was below normal, but the heparin tolerance curve was normal or indicated hypercoagulability. Rarely both the heparin tolerance test and the determination of the amount of prothrombin in the blood revealed normal values; these patients nearly always presented pulmonary embolism as their first symptom in the absence of any peripheral sign. Treatment of postoperative thromboembolism consisted of intravenous administration of massive doses of heparin for 48 hours (600 mg. per 24 hours). On the second day administration of ethyl biscoumacetate (tromexan®) was begun. A heparin tolerance test and prothrombin determination were repeated every 48 hours. Treatment was arbitrarily considered as effective when the normal coagulation time was doubled according to the heparin test. As soon as this result was obtained, it sufficed to maintain the patients for 8 to 10 days at hypocoagulability values varying between 150 to 200% of the control values. Spread of thrombosis or hemorrhages was prevented satisfactorily by strict use of this method. Prophylactic preoperative anticoagulant treatment was not practiced, but the patients who before the operation had a tendency to phlebitis on careful clinical examination or had a positive test for increased coagulability of the blood were given prophylactic treatment with heparin or ethyl biscoumacetate between the third and fifth postoperative day. None of the patients thus treated had phlebitis or hemorrhage.

Rev. Española Enferm. Aparato Digest, Madrid

10:551-676 (Nov.-Dec.) 1951. **Partial Index**

Rectocolic Polyposis and Cancer. P. Hillemand and R. Viguie.—p. 551.
Roentgen Aspects of Superficial Enteritis. P. A. Maissa.—p. 561.
*Stellar Angioma in Diagnosis of Liver Cirrhosis. B. Varela Fuentes and H. Gutiérrez Blanco.—p. 573.
Congenital Absence of Gallbladder *in Primary* Cancer of Liver. E. Oliver Pascual.—p. 581.
Benign Tumor of Stomach. E. Vidal-Colomer, J. Badosa Gaspar and M. Fuste Panisello.—p. 593.

Stellar Angioma in Liver Cirrhosis.—Stellar angioma mainly located on the anterior aspect of the chest, the skin over the upper third of the sternum, or the supraclavicular fossas is an early, characteristic sign of liver cirrhosis, although cirrhosis may occur without angioma. Stellar angioma was observed in 34 of 57 patients with Laennec's cirrhosis. It was present in 28 of 46 men and in 6 of 11 women; in 10 of 12 patients between the ages of 41 and 50 years; in 28 of 41 drinkers and in 6 of 15 patients who did not drink; in 26 of 40 patients with ascites and in 8 of 17 patients without ascites; in 11 of 14 patients with hemorrhage in the gastrointestinal tract and in 23 of 43 patients without such hemorrhage; in 10 of 14 patients with acute jaundice, 20 of 34 with subacute jaundice, and in 3 of 7 patients without jaundice; and in 26 of 32 patients with anemia and 7 of 16 patients without anemia. Stellar angioma as an early sign of liver cirrhosis may appear either alone in the aforementioned spots or in association with angioma in other areas of the body. Angiomas were observed more frequently and in greater number in the advanced stages of the disease, in patients with ascites, gastrointestinal hemorrhage, jaundice, and anemia. In rare cases stellar angioma develops so extensively that it simulates the exanthema of scarlet fever. This type of angioma was observed in only 1 of the 57 cases. In this case the disease followed a rapid, fatal course. Hemorrhagic ascites, liver cirrhosis, and primary multinodular cancer of the liver were observed at necropsy.

Zentralblatt für Gynäkologie, Leipzig

74:1-48 (No. 1) 1952. **Partial Index**

Neuroregulation of Ovary. *K. Nordmeyer.—p.* 2.
Influence of Adrenal Cortex on Permeability of Placenta. R. Schuurmans.—p. 20.
Action of Vitamin E on Gonadotropic Effect of Anterior Lobe of Hypophysis. W. von Massenbach and A. Stadtmüller.—p. 25.
Absorption of Sulfonamides by Pulmonary Surface After Inhalation. H. Dieckmann.—p. 35.
*Endometrial Hyperplasia and Uterine Carcinoma: Possible Cancerogenic Effect of Estrogenic Hormone. G. Winter.—p. 38.

Possible Cancerogenic Effect of Estrogenic Hormone.—Winter feels that if the estrogenic hormones actually produce cancer in human subjects, carcinoma of the body of the uterus should be comparatively frequent in women who have received high doses of estrogenic hormones. His own inquiries on this point in women with uterine carcinoma disclosed no case in which there had been medication with excessive doses of estrogenic hormone. He then gives the history of a young woman, who, because of repeated amenorrhea, took large doses of estrogenic hormone over long periods. These excessive doses of hormones were followed by profuse and prolonged uterine bleeding. Curettage was performed and histological examination of the material obtained at curettage revealed carcinoma adenomatosum. However, because the patient was relatively young, uterine extirpation was postponed until further studies had been carried out. The studies suggested the presence of ordinary glandular hyperplasia, but at some sites the changes were such that carcinoma could be suspected. However, the further history of this patient did not support the diagnosis of carcinoma. The author concludes that caution is necessary in evaluation of extreme proliferation of the uterine mucosa. Changes suggestive of carcinoma have been observed with and without hormone medication.

BOOK REVIEWS

Heart Disease. By Paul Dudley White, M.D., Executive Director, National Advisory Heart Council, Boston. Fourth edition. Cloth. $12. Pp. 1015, with 169 illustrations. The Macmillan Company, 60 Fifth Ave., New York 11, 1951.

For the past 20 years White's Heart Disease has been a standard text and reference book on heart disease. Even though it is only six years since the third edition, the many advances in the field have made it necessary for the author to make such extensive revisions that the book is to a large extent rewritten. As in previous editions, Dr. White has done a thorough job in covering all phases of the subject. In order not to increase the size of the book, some of the older, well-established material has been condensed to give room for a discussion of recent advances on diagnosis and treatment. It is unfortunate that restrictions of space were imposed upon the author, because some important subjects seem to have received insufficient emphasis and discussion. For instance, the physiology of congestive heart failure, indications and contraindications for mitral commissurotomy, and the pharmacology of drugs used in treatment of congestive heart failure have been treated in a somewhat sketchy manner. This is not a serious defect, however, because there is an extensive bibliography including many recent references.

The book is well written and easy to read. An excellent chapter on the evolution of our knowledge of heart disease is placed at the beginning of the book. The rest of the book is divided into three sections: part 1 deals with the cardiovascular examinations and includes not only physical signs but electrocardiography, roentgenography, and newer techniques, such as ballistocardiography, angiocardiography, and cardiac catheterization; part 2 deals with the various etiological types of heart diseases; and part 3 takes up the disorders of cardiovascular function. There are many well-chosen illustrations accompanying the text.

This book is recommended as a textbook on heart disease for the medical student as well as a reference book for the practicing physician.

℞ for Medical Writing: A Useful Guide to Principles and Practice of Effective Scientific Writing and Illustration. By Edwin P. Jordan, M.D., and Willard C. Shepard. Cloth. $2.50. Pp. 112, with 26 illustrations. W. B. Saunders Company, 218 W. Washington Sq., Philadelphia 5; 7 Grape St., Shaftesbury Ave., *London, W.C.2, 1952.*

This book provides information on the preparation for publication of medical manuscripts. The information is well presented. To emphasize the necessity for rewriting, the senior author devotes entire chapters in the book to each of the following phases of preparing a manuscript: the first draft, the first revision, the second revision, the third revision, the beginning, and the end. Some writers do not stop at three revisions to perfect their papers; even so, it is amazing how mistakes still can appear in the finished product. The emphasis on this method for preparing a medical manuscript is well taken. The paragraph on page 1 on how to get ideas for a medical paper will interest those who would like to write for publication but are not sure what subject to write about.

Dr. Jordan is rather skeptical of the use of footnotes in medical manuscripts. It might have been helpful to inexperienced writers to have included on page 29 examples of the type of unnecessary footnote and of the type of footnote in which the information given should be included in the body of the paper.

The chapter on statistics employed in medical papers is excellent and covers a subject to which medical writers could well give more study.

The chapter on the preparation and use of illustrations in medical manuscripts, which was written by Mr. Shepard, likewise is excellent.

The appendices include tables of international atomic weights and of temperature conversion from centigrade to fahrenheit and from fahrenheit to centigrade, lists of abbreviations and proofreaders' marks and of useful equivalents of weights and measures, a table of χ^2 probability scale, and references to books that may be useful to medical writers.

This book will be very helpful to medical writers who anticipate publishing their manuscripts.

Standard Nomenclature of Diseases and Operations. Richard J. Plunkett, M.D., Editor, and Adaline C. Hayden, R.R.L., Associate Editor. Fourth edition. Cloth. $8. Pp. 1034. Published for American Medical Association by Blakiston Company (division of Doubleday & Company, Inc.), 1012 Walnut St., Philadelphia 5, 1952.

Revision and publication of this edition of Standard Nomenclature of Diseases and Operations was carried out as the result of a decision made at the Fifth National Conference on Medical Nomenclature, which was held under the auspices of the American Medical Association in Chicago in June, 1948. The revision was carried out under the direction of an Editorial Advisory Board and editors appointed by the Board of Trustees of the American Medical Association. Twenty-three committees comprised of 82 outstandingly qualified specialists participated in this revision.

One of the changes in this edition is the inclusion of the code numbers of the International Statistical Classification of Diseases, Injuries and Causes of Death parenthetically and in an appendix for cross reference to Standard numbers. The International List code numbers were included for use as a cross coding to Standard Nomenclature code numbers in the carrying out of large scale statistical surveys by associated hospital groups or by state, national, and international health or medical organizations. The International List numbers are not intended in any way to replace the Standard code numbers for use in hospital records or as a substitution for Standard numbers in clinical research.

In the fourth edition the section on eponyms, which appeared in the third edition, has been combined with the general disease index. The disease index and operations index have been placed consecutively in the back of the book immediately following the Nomenclature of Operations, and the Supplementary Terms lists, which previously appeared after several of the sections in the body of the book, have been grouped as a separate division of the book under section headings in which these terms most frequently occur.

This edition also includes a thoroughgoing revision and change in manner of presentation of diagnoses appearing under the "Diseases of Psychobiologic Unit," "Diseases of the Hemic and Lymphatic Systems," and in category eight "New Growths." Revision of these three sections were made cooperatively with interlocking committees representing respectively the American Psychiatric Association, the Committee for Clarification of the Nomenclature of Cells and Diseases of the Blood and Blood Forming Organs, and for "New Growths" an over-all sponsoring group, which includes the American Cancer Society, American Society of Clinical Pathologists, Armed Forces Institute of Pathology, National Research Council's Subcommittee on Oncology, U. S. Public Health Service, and the U. S. National Committee on Health and Vital Statistics.

In order to avoid the necessity of extensive changes in hospital systems already established, revisions of other sections of the book were kept as much as possible to a minimum. Nevertheless, more than 5,000 changes, which included additions, deletions, or corrections in diagnosis and coding, were made in this edition to cover needed consistency changes, and changes concerned with newer scientific concepts and advances in knowledge since publication of the third edition in 1942. Because Standard Nomenclature is now used in more than 70% of the hospitals of the United States the changes in this revision, which represent changes in diagnostic terminology over the past 10 years, become essential for incorporation in hospital recording systems in order that records properly represent current scientific thinking.

The reviews here published have been prepared by competent authorities and do not represent the opinions of any official bodies unless specifically stated.

QUERIES AND MINOR NOTES

HYPERTENSION IN THE AGED

To the Editor:—*I am 83 years old and have never had a systolic blood pressure over 140 mm. Hg. Last March I had an attack of coronary thrombosis. Treatment included bed rest in a hospital for a month, two blood transfusions, oxygen for two days, papaverine hydrochloride, 0.78 gm. (12 grains) a day, and bishydroxycoumarin (dicumarol®). I am now convalescing and am able to drive my car for short trips. Recently, my blood pressure was 180/90 mm. Hg. I was placed on a salt-free diet, and one package of "carbo-resin" to be taken three times a day and a tablet, to be taken three times a day, containing veratrum viride, 100 mg., mannitol hexanitrate, 30 mg., rutin, 20 mg., and phenobarbital, 15 mg., were prescribed for me. An abstract in* The Journal *(147:191 [Sept. 8] 1951) described a treatment for malignant hypertension that included veratrum viride and hexamethonium iodide. I do not consider my case serious enough to warrant adopting this treatment. What is your opinion?*

M.D., Wisconsin.

Answer.—Evidently, your convalescence from the attack of coronary thrombosis has been satisfactory. A blood pressure reading of 180 mm. Hg is not unusual at your age; your condition is essentially systolic hypertension, depending, in part, on arteriosclerosis rather than on serious hypertension. Aside from mild measures of therapy, such as a diet somewhat low in salt, and using common sense no particular treatment is needed. Generally, a salt-free diet, "carbo-resin," and veratrum and its derivatives are reserved for more serious cases of hypertension.

MICROCEPHALY

To the Editor:—*A 2-month-old girl weighing 11 lb. (5 kg.) has a head only 14¾ in. (37.47 cm.) in circumference and an anterior fontanel less than ½ in. (1.27 cm.) in diameter. She has regurgitated after each feeding but coos and has good head control. Her parents and three siblings have heads slightly above average size and are of superior intelligence. Is this a case of microcephaly or premature calcification? Would it be advisable to discontinue giving vitamin D in the hope of delaying closure of the fontanel?*

M.D., California.

Answer.—At birth, the average head circumference of girls is 13½ in. (34.29 cm.); at one month, it is 14⅞ in. (37.8 cm.); and, at two months, it is 15¾ in. (40.01 cm.). The average weight at two months is 10½ lb. (4.73 kg.), therefore, this baby's weight is slightly above average, and her head circumference is a little smaller than average. This single measurement, however, does not indicate microcephaly or premature calcification of the skull. The circumference of the chest should also be measured and compared with the circumference of the head. Normally, the head circumference remains larger than the chest circumference until the 12th to the 18th month, and, thereafter, the chest circumference is greater than the head measurement. Until this comparison is made, no abnormality can be determined from a single measurement. In the case in question, even if the head circumference proved less than the chest circumference at two months, it would not be advisable to discontinue giving vitamin D in the hope of delaying closure of the fontanel. This procedure would only produce rickets. The circumference of the head is dependent on the growth of the brain, and, if for any reason brain growth is retarded, the head will become smaller or microcephalic, and the fontanel will close prematurely. At present, there are no well-tested therapeutic measures for retarded growth of an infant's brain.

IDENTIFICATION OF FUNGI

To the Editor:—*What special tests are available to determine Candida (Monilia) or Leptothrix infections of the vagina and vulva? There is said to be a quick clinical test for use on ambulant patients, in which a hanging drop preparation is made and immediately examined by microscope.*

M.D., Germany.

Answer.—An improved method for staining Candida and other fungi in material from the skin and mucous membranes has been recently described by Klingman, Pillsbury, and Mescon (*J. A. M. A.* **146**:1563-1565 [Aug. 25] 1951). The only way to accurately identify a pathogenic Candida organism, however, is to cultivate it and observe its growth structure or inject it into animals. A slide culture for the identification of Candida albicans has recently been described by Fusillo, Learnad, and Dozier (*Am. J. Clin Path.* **22**:83-85 [Jan.] 1952). This method has not displaced the standard method of cultures on plates. In the office, one may make the diagnosis by means of a fresh drop of vaginal secretion well mixed with an equal amount of 10% sodium hydroxide. Examination of this fresh preparation under the microscope will show the mycelia in many instances.

PROCAINE AND ALLERGY

To the Editor:—*Please discuss the oral use of procaine and ascorbic acid in treating allergic conditions. I should like to know the dosage for both adults and children, especially for asthma, hay fever, and urticaria. Have there been any toxic reactions reported from the oral use of procaine? Would you recommend the routine use of procaine and ascorbic acid with penicillin and antitoxin therapy?* *M.D., Tennessee.*

Answer.—Other drugs are more effective than procaine in treating allergies. The effect of procaine on allergic reactions is not proved, and it is not known how often toxic reactions occur, as the drug has not been used enough to verify its results. Recently, Schapiro and Sadove (*Ann. Allergy* **8**:85, 1950), described a case in which procaine hydrochloride taken orally, in doses of 10 grains (0.60 gm.) four times a day, was effective. In spite of good results obtained in this case, it must be recognized that in asthma many factors can modify the symptoms, and it is necessary to be skeptical about a new remedy, especially if the reason for its use is so obscure. The routine use of procaine cannot be recommended at this time. Ascorbic acid is not only the antiscorbutic vitamin C, but it is also a reducing agent. Some years ago, it was said it could counteract allergic symptoms, but the reports on this are still controversial. Ascorbic acid is not toxic, even in doses as large as 3.0 to 5.0 gm. a day. It does not affect the symptoms in any regular way. There is no evidence that it can prevent systemic, serum disease-like reactions that are sometimes caused by penicillin or antitoxin.

ANOREXIA NERVOSA

To the Editor:—*A 4-year-old girl sleeps and plays normally but does not want to eat; two or three glasses of milk a day satisfy her. She complains of stomach pain. Roentgenograms of the chest and abdomen are normal. She has not lost weight, but she is extremely nervous.*

J. M. Martin, M.D., Anna, Ill.

Answer.—This child has the symptoms of anorexia nervosa. This condition does not usually occur in early infancy, but commonly first becomes manifest in children from three to five years of age. In this age period the child is characteristically negativistic, and efforts to force him to eat bring forth a stubborn response. This is often accompanied by a strong nervous element, and such a child is usually more highstrung than phlegmatic. Transitory periods of poor appetite are not rare in childhood, and should food be forced at such a time a chronic

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feeding problem may develop. Many children develop poor feeding habits as a means of gaining attention; combining poor appetite with forced vomiting, they may become little tyrants and dominate the home. As this habit usually develops at the time when the child is losing infantile chubbiness and is acquiring the more linear physique of childhood, the parents often fear that malnutrition is setting in.

The introspective or day-dreaming child often dawdles over his food, while the extrovert may be so active that he devotes little time to eating. Management of these cases consists of removing environmental factors that are likely to induce anxiety or tension in the child. If the parents are unable to assume an attitude of unconcern, the difficulty may often be surmounted by placing the child in the care of a calm relative or stranger who will not be intimidated; this is true particularly in cases in which the child is attempting to dominate the parents. When there is a considerable nervous factor, a mild bromide or barbiturate sedative, or a combination of the two, may overcome it and the anorexia. Vitamin B preparations have been tried; however, as with other so-called tonics, their specificity is doubtful. Time and patience are usually the greatest aids in overcoming this problem.

ADRENAL HEMORRHAGE IN THE NEWBORN

To the Editor:—*Please discuss possible causes of bilateral adrenal hemorrhages in a 9 lb. stillborn child.*

M.D., New York.

Answer.—The usual cause of adrenal hemorrhages is trauma during delivery. Edith L. Potter, in "Pathology of the Fetus and the Newborn," Year Book Publishers, Chicago, 1952, says, "The statement made by some investigators that the adrenal gland of the newborn is always hemorrhagic is not correct, and hemorrhage into the adrenal is actually uncommon. When hemorrhage does occur it begins in the central part of the gland and generally spreads to involve the entire structure. An accumulation of as much as 30-40 cc. may remain in the capsule. With larger hemorrhages the capsule generally ruptures and the escape of blood into the surrounding connective tissue produces perirenal hemorrhage. Such hemorrhage is often unilateral, although occasionally both glands are involved.

"The mechanism producing adrenal hemorrhage has never been satisfactorily explained, although it is most often seen in infants delivered from a breech position and it is generally thought to be a result of trauma inflicted on the fetal abdomen during delivery of the head. It is rarely accompanied by bleeding in other areas and there is no indication that lowered prothrombin is responsible. The cause of death in infants with such hemorrhage is not clear, especially when only one gland is involved, since insufficient blood is lost to cause death from exsanguination. It has been suggested that destruction of an adrenal gland is responsible for shock to which the infant succumbs. It is possible that, when a single gland is involved, the finding is coincidental and not related to death even though no other explanation for death can be found. In older infants calcified areas which are a result of earlier hematomas may distend the central portion of the gland, thus giving evidence that all adrenal hemorrhages are not fatal."

CHRONIC EXPOSURE TO NITROGLYCERIN

To the Editor:—*We see patients who are employed at the Badger Ordnance Works and who handle glyceryl trinitrate (nitroglycerin). They complain of menstrual disturbances, especially missed periods. There have been a few skin rashes. Some of the men have complained of peculiar sensations in the penis. Can you give me information on the cutaneous and systemic effects of chronic exposure to and handling of glyceryl trinitrate?* *O. V. Pawlisch, M.D., Reedsburg, Wis.*

Answer.—Glyceryl trinitrate is a direct irritant to the skin and more so to the mucous membranes. Like mercury fulminate, another explosive, it has a way of working in under the nails, with destructive results. Otherwise, it leads to skin drying and ulceration, notably of the palms. Handling of the male genitalia with contaminated fingers could lead to penile irritation. Glyceryl trinitrate is readily absorbed through the skin with ensuing constitutional effects. The characteristic feature of systemic involvement, whatever the portal of entry, is headache. In the absence of headaches, other constitutional characteristics may be doubted. Diarrhea as a manifestation of enteritis is common, otherwise the disturbances are those associated with low blood pressure. Menstrual disorders may not be characteristic but are possibly caused by low blood pressure.

TRICHOMONAS VAGINALIS

To the Editor:—*My patient is a normal, healthy woman, aged 39, and mother of two children. Two months after the birth of her second child, in 1943, there was a marked vaginal discharge, and numerous trichomonas were present. Previous cautery had been done. No cervical erosion was present. Among the recent treatments used have been acetylaminophenol arsenic acid (stovarsol®) powder, vaginal insufflation with acid douches, injection of the walls of the vagina with penicillin, and insufflations of argyrol® (mild silver protein), kaolin, and beta-lactose. Stool and urinalysis show no trichomonas. I have successfully treated many of these cases, but this one seems to defy all my methods.*

Edna F. Patterson, M.D., Sanitarium, Calif.

Answer.—Frequently Trichomonas vaginalis vaginitis is difficult to cure. In the patient herself, among the sources of reinfection are Skene's ducts, Bartholin's glands, the cervix, the urine, and, perhaps, the rectum. In rare instances a bed pan or an enema tube may harbor trichomonas. Occasionally the husband is a source of reinfection, and smears should be made from under the prepuce, and the bladder should be studied for trichomonas, both with and without prostatic massage.

A matter of great importance is the cleansing of the anus after a bowel movement. Patients should be instructed to use a sweeping motion directed away from the vagina and toward the sacrum. The significance of this method of cleansing the anal region should be impressed on the patient, even though the intestinal type of trichomonas differs from the vaginal type.

A drug which has given satisfactory results in some refractory cases is aureomycin applied locally in the form of powder and capsules; however, some women have pruritus vulvae and pruritus ani as a result of this form of medication.

HUMIDIFICATION OF OXYGEN

To the Editor:—*Please comment on the advisability of humidifying oxygen, bubbling it through water, prior to using it therapeutically by mask or nasal catheter. An anesthesiologist has suggested that oxygen is already humidified enough and that humidification is unnecessary. Would you advise routine use of humidifiers? Are there any studies on the alveolar or arterial oxygen concentrations that occur after the use of a rubber or glass funnel near, but not totally covering, the face of the newborn infant?* *M.D., California.*

Answer.—Humidification of oxygen by using the usual mask is not routinely necessary, because the nasal mucous membranes can moisten gases in the normal way. In damp climates, it has been found that use of a water bottle or moistening a reservoir bag adds to the patient's comfort, particularly at the beginning of therapy. It has been noted, in some localities, that oxygen therapy is unduly drying during wet seasons but comfortable during dry seasons. A nasal catheter should always be used with the water bottle, because the usual moistening membranes cannot act on the oxygen supplied, and the dry oxygen continuously impinges on a small area. (Tank oxygen contains no water vapor for practical purposes.)

When no drying effect is desired (in softening or preventing tenacious secretions), a water bottle, although helpful, is ineffective compared to nebulization of water directly into the mask to supply water in colloidal particles as well as vapor to obviate the necessity of the addition of water vapor when gases are heated to body temperature in respiratory passageways. A glass funnel held four inches from the face is ineffective in raising alveolar oxygen partial pressure, but, held against the face it is as effective as a nasal catheter but less effective than a well-used mask.

Reference:

Campbell, A., and Poulton, E. P.: Oxygen and Carbon Dioxide Therapy, London, Oxford University Press, 1934, p. 124.

WATERHOUSE-FRIDERICHSEN SYNDROME

To the Editor:—*On a Saturday morning at 11 o'clock an 8-month-old baby girl was given the third shot of diphtheria, pertussis, and tetanus antigens. In the afternoon, she became irritable and by 10 p. m. had a fever. At one o'clock the following morning, her fever was worse, she had a choking reaction, and purpuric spots began to appear. The parents rushed her to me, but she died on the way. When I saw her, her body was covered with purpuric spots, and her fingers were claw-like and spastic, in spite of the fact that rigor mortis had not set in. At autopsy, the only pathological conditions observed were a slightly enlarged thymus and hemorrhagic adrenal glands. Could this condition have been a Waterhouse-Friderichsen syndrome? A differential white blood cell count revealed only 2.5% polymorphonuclear leukocytes, the remainder being lymphocytes and monocytes. Could this have been due to anaphylaxis? I have used the same combination of diphtheria, pertussis, and tetanus antigens on other children and have had no bad results. Do you think these antigens could have caused this condition?*

Louis M. Pavletich, M.D., Raton, N. Mex.

Answer.—If the triple antigens had not been given one would feel justified, on considering the available evidence, in concluding that death was due to the Waterhouse-Friderichsen syndrome. A positive blood culture for meningococci should confirm that diagnosis. In this unusual case, there is a slight possibility that there was sufficient shock from the immunizing agents to precipitate the Waterhouse-Friderichsen syndrome in the child, if she had a meningococcic infection without clinical signs at the time of the injection; however, it is probable that the administration of the antigens played no part in the fatal termination. The details reported indicate that a diagnosis of anaphylaxis as the cause of death should be accepted only with the utmost reluctance. It seems almost certain that the immunization injection was purely coincidental to the cause of death.

BODY ODORS AND ETHYLENE GLYCOL

To the Editor:—*We are altering two dining rooms, each having facilities for about 700 patients, whose mental levels vary from idiot to normal. About one-fifth of the patients are epileptic. The architect has advised that ethylene glycol be diffused through the ventilating equipment. He indicated that a small school project completed some time ago utilized this chemical with resultant decrease in the incidence of common colds. Would ethylene glycol be effective in deodorizing these rooms? We would appreciate comments.*

Neil A. Dayton, M.D., Mansfield Depot, Conn.

Answer.—Ethylene glycol would not be effective in deodorizing rooms because of body odors of the inhabitants. As for using ethylene glycol diffused into the air for disinfecting purposes, published studies show that the incidence of airborne organisms that cause infection can be reduced under experimental conditions; however, the presence of glycol vapor in a space controls spread of disease only within that space and confers no protection to a person exposed in other areas. Thus, a person may move from a protected area to another room and there be exposed to infectious organisms. Evidence to show that ethylene glycol vapor is an effective agent for disinfecting air in homes, offices, schools, barracks, factories, or places of public congregation is not yet conclusive.

INFLUENZA PROPHYLAXIS

To the Editor:—*Are prophylactic injections against influenza and common colds in general use? Do they produce immunity? If so, what products are used?*

W. P. Bope, M.D., Decatur, Mich.

Answer.—Vaccine for active immunization to influenza is not in general use. There are two types, A and B, of virus of influenza. Each of these types has a number of strains, all of which do not cause the same antigenic response; therefore, during an outbreak of influenza, it would be necessary to determine the strain of virus responsible before an appropriate vaccine could be prepared. With a suitable vaccine, any immunity that can be established is comparatively brief. Much work has been done, but it is largely of an experimental nature (Prophylaxis of Influenza, editorial, *J. A. M. A.* 148:554 [Feb. 16] 1952).

PERIODIC RETROBULBAR PAIN

To the Editor:—*A 32-year-old woman suffers almost daily from an excruciating pain behind the left eye, often with hemicrania. The only positive finding is a vasomotor rhinitis, which is so severe that the left turbinates block the left airway almost constantly. Neurological examination, including electroencephalograms and ophthalmologic examinations are normal. There is premenstrual tension, which aggravates the retrobulbar pain and headache, but this is being controlled by estrogens. Suggestions as to cause or treatment will be appreciated.*

Milton I. Steckler, M.D., Los Angeles.

Answer.—In view of the absence of neurological and ophthalmologic findings, further investigation of the nasal and sinus status is indicated. A roentgenogram, cytological examination of the nasal secretions, and skin tests could contribute additional evidence to explain the basis for an underlying nasal allergy. Infraction of the middle turbinate is sometimes helpful when the middle turbinate impinges on the lateral nasal wall in such a manner as to interfere with sinus drainage. Among other possible causes to be considered are migraine, histamine headache, psychogenic headache, and some of the atypical facial neuralgias.

TUBERCULOSIS PATIENTS IN GENERAL HOSPITALS

To the Editor:—*In* The Journal (**147:***1090 [Nov. 10] 1951), the answer concerning tuberculosis patients in general hospitals misses the important point. What was said covers the isolation technique adequately, but the important point is the fact that a large number of patients with unknown cases of active tuberculosis are admitted to general hospitals (three to four times as many as are known). These patients have all sorts of ailments along with pulmonary tuberculosis, or they may have tuberculosis that is masquerading as another disease. In a general hospital, these patients with unknown cases of active tuberculosis are a much greater source of infection for hospital personnel and other patients than is the occasional patient with a known case for whom the precautions you have so well enumerated are taken.*

The only way to guard against these unknown cases is to have routine hospital admission roentgen examinations taken of every patient. Photoroentgenography is both accurate and inexpensive. If roentgen interpretation of pulmonary disease, possibly tuberculosis, is incorporated in the patient's chart, the doctor will be able to take the proper isolation precautions. It is incumbent on the doctor to do so to protect the hospital personnel and other patients. An important extra dividend of routine roentgenography for all new patients is the early discovery of patients with unknown cases of tuberculosis, whose period of illness is thereby made shorter and easier. For a general hospital, the combination of routine admission chest roentgenography plus adequate isolation precautions for patients with suspicious and known cases is the procedure of choice.

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San Jose 20, Calif.

DEATH OF RABBITS AFTER PREGNANCY TEST

To the Editor:—*In your answer to an inquiry concerning the death of rabbits after pregnancy test in* The Journal (**148:***327 [Jan. 26] 1952), nothing is said about deletion of all medication for 48 to 72 hours before collection of the specimen. Any medication means not only medicaments prescribed but all that is taken by the patient without medical advice. It has been our experience that if patients are instructed to take no medication, when previous specimens killed the rabbit, fatalities do not occur, particularly if serum is used.*

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MANAGEMENT OF CHEST INJURIES

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and
B. D. Stewart, M.D., Denver

Wars accelerate interest and experience in the treatment of injuries; however, with the cessation of hostilities, interest lags, in spite of numerous civilian injuries incurred in automobile and industrial accidents. The experiences in World War II revolutionized the treatment of chest injuries: techniques were improved, the physiology of the thorax was better understood, and trained surgical teams were able to handle chest injuries rapidly and efficiently. Even with the extensive information on this subject, there is little specific information for training emergency teams in the proper handling of patients with chest injuries before they come into the hands of a trained surgeon. In this article, we have enumerated the specific treatments for patients with chest injuries from the time they are placed in the ambulance until the treatment is concluded.

EMERGENCY TREATMENT

Emergency Treatment in the Ambulance.—Emergency treatment should start in the ambulance. Persons injured in isolated areas often have to be transported long distances by surface or air ambulance. Ambulance attendants can be trained, as were Army Corps men, to carry out certain specific emergency procedures in patients with chest injuries. The impression is widespread that the use of air ambulance is contraindicated; however, we had two patients with open chest wounds who were recently flown in over the mountains at over 14,000 ft. Because attendants carefully watched the intrapleural pressures and administered oxygen, both patients were unquestionably in better condition than they would have been had they been transported by surface ambulance for the necessary 14 hours. Carson[1] reported that 500 patients with chest injuries of all grades of severity and with all of the usual complications were flown from Okinawa and Iwo Jima to Guam without fatality en route. The ambulance attendants should be taught to administer artificial respiration, seal sucking wounds, maintain a clear airway, treat tension pneumothorax, restore blood pressure, and administer oxygen and narcotics.

There are various methods of artificial respiration. Beecher[2] considers the modified Sylvester method as the least exhausting to the rescuer. The National Research Council[3] has recently recommended the Holger Neilson method. In this latter system, the person needing resuscitation is laid face down with his arms folded and his hands under his face. The operator kneels on either side of the victim's head and first presses on his ribs to evacuate his lungs. Then he lifts and pulls the victim's folded arms upward and toward himself as he sways backward, grasping the victim's arms above the elbows. The operator tries to get through this cycle once every five seconds.

Sucking wounds of the chest are those in which a hole in the chest wall causes an audible noise with each respiration. They should be sealed at once with an air-tight dressing of petrolatum gauze and adhesive tape. Skinner and his associates[4] have explained the consecutive physiological effects of an unsealed sucking wound: (1) collapse of the homolateral lung, (2) shift of the mediastinum toward the contralateral side, (3) swinging mediastinum, and (4) exchange of air between the two lungs. A patient with an open sucking wound soon goes into physiological shock, which is unrelated to blood loss and which no amount of blood or plasma will remedy until the physiological disturbance itself is corrected.

Palpable rales indicate a dangerous accumulation of secretion in the tracheobronchial tree (Williams[5]). The patient with blood and secretions in his air passages will remain in shock, become cyanotic, and may die of respiratory failure. The ambulance attendant should place the patient in the Trendelenburg position, encourage cough-

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From the Department of Surgery, University of Colorado School of Medicine.

[1] Carson, L. D.: Experiences in Air Transportation of Patients with War Wounds of the Chest, Dis. Chest **14**: 254-260 (March-April) 1948.

[2] Beecher, H. K.: Early Care of the Seriously Wounded Man, J. A. M. A. **145**: 193-200 (Jan. 27) 1951.

[3] Back Pressure-Arm Lift Method for Administering Artificial Respiration Recommended: Council on Physical Medicine and Rehabilitation, J. A. M. A. **147**: 1454 (Dec. 8) 1951.

[4] Skinner, E. F.; Carr, D.; Kessler, C. R., and Denman, W. E.: Chest Injuries in Civilian Practice, Dis. Chest **18**: 363 (Oct.) 1950.

[5] Williams, M. H.: Intrabronchial Hemorrhage in Battle Casualties, J. Thoracic Surg. **16**: 342-352 (Aug.) 1947.

ing, and suck out accumulated secretions. Ambulances should be equipped with suction and the attendants taught to insert a catheter through the nose into the trachea to clear the air passages.

Tension pneumothorax is more difficult to diagnose and treat than other emergencies but must be dealt with in the ambulance, particularly air ambulance. Tension pneumothorax occurs when there is an unsealed leak from the lung into the pleural cavity with the chest wall air-tight. The best sign of it is deviation of the trachea from the midline away from the air-filled hemithorax, and other signs are dyspnea, cyanosis, and shock. In emergency treatment a no. 15 needle with a short bevel is inserted into the chest cavity on the side that is filled with air under pressure. A flutter valve is made by tying a finger cot with a hole cut in the end around the needle. The needle is inserted in the second intercostal space in the midclavicular line and held in place by application of a hemostat across the needle and strapping it to the chest wall. This needle is left in place during the time the patient is being transported.

Blood pressure readings should be taken by the ambulance attendant. When the systolic blood pressure falls below 85 mm. of mercury, plasma should be given intravenously to restore the blood pressure to that level (Beecher [2]). However, in the ambulance only enough blood substitute should be used to restore the pressure to 85 mm. systolic, because, if more is used, bleeding may start again with further loss of hemoglobin. If the patient becomes cyanotic, oxygen should be administered by mask or nasal catheter while the patient is being transported.

Ambulance attendants should be cautioned against using large doses of morphine in chest injuries, to avoid depressing respiration and inhibiting the cough reflex. Beecher [2] has pointed out that a small dose of morphine, ⅙ grain (10 mg.), relieves pain as effectively as a large dose. Morphine is most effective when given with barbituates, which allay apprehension. If the patient is in shock, the morphine given subcutaneously will not be taken up in the circulation and should be administered intravenously.

Emergency Treatment in the Hospital.—The second phase of the emergency treatment of thoracic injuries is carried out in the hospital admitting room and is concerned primarily with the treatment of shock, restoration of cardiorespiratory function, and preparation for emergency surgery. Sedatives and other necessary medicaments, such as antibiotics and antitoxins, should be given. Shock may be due to blood loss, but, if the patient has cardiac tamponade, flail chest, tension pneumothorax, or an obstructed airway, he will remain in shock in spite of the administration of blood or fluids. Blood volume should now be restored by whole blood transfusions. In the severely shocked patient, arterial transfusions will restore the coronary circulation more rapidly and effectively than venous transfusion and may be lifesaving. Sodium chloride solution should not be used intravenously, because of the danger of pulmonary edema. If the patient has not recovered from shock after three hours of treatment, he is probably bleeding seriously and should be operated on to stop the bleeding even though he is still in shock.

Cardiac irregularity suggests cardiac contusion. Contusions of the heart are particularly common in automobile accidents. Skinner and associates [4] point out that physical examination may reveal little of diagnostic value but that repeated electrocardiograms can show changes similar to those seen in an acute coronary infarction. A patient with these changes should be treated as though he had myocardial infarction, with adequate bed rest and oxygen while he has dyspnea or tachycardia. Care should be exercised in administration of anesthetics to a patient with suspected contusion of the heart.

The emergency methods of maintaining a clear airway were described previously. In the hospital admitting room, bronchoscopy may be done and, when bleeding is severe enough to require continuous suction, a tracheotomy should be performed. The gastric contents should be aspirated before the injured person is sent to the operating room, because the stomach often will not empty for many hours after an injury. Serious accidents can be avoided if the stomach is emptied before an anesthetic is administered.

EVALUATION OF INJURIES

Emergency surgery requires the same careful diagnosis as elective surgery.

History and Physical Examination.—It takes only a few minutes to get a history of the injury from the patient or the attendant. A history of hemoptysis after the accident, unconsciousness, urinary retention, or the previous administration of tetanus toxoid is important information. All injured patients should have thorough physical examinations, which should include a complete neurological examination for evidence of central nervous system injury. Important signs of chest damage are subcutaneous emphysema, deviated trachea, pneumothorax, enlarged heart or irregular beat, and rib fractures. Pertinent signs in the abdomen are tenderness, rigidity, and the presence or absence of bowel sounds. The extremities should be examined for evidence of fractures. The examination should include a blood cell count, in a search for evidence of hemorrhage, and urinalysis, to determine the presence of blood.

X-Ray Examination.—Roentgenologic examinations are essential for the diagnosis of injuries and should include fluoroscopy. The patient who has a chance for recovery can tolerate the few x-rays necessary to permit a diagnosis. Chest x-rays will show the presence of pneumothorax or hemopneumothorax and also evidence of mediastinal shift. Over penetration films will best demonstrate rib fractures or foreign bodies.

It is important to know the course and position of a foreign body or missile, although this is difficult. Burbank and his associates [6] outlined excellent methods for locating a foreign body in the chest, beginning with posteroanterior and lateral x-rays of the chest. The chest is then divided into three perpendicular compartments on both x-rays; the foreign body is extrapleural if it lies outside these sectors. Fluoroscopy and spot x-rays are next used for better location. If a foreign body moves synchronously with pulsations of the heart, it is either in the lung or in the mediastinum. In difficult cases, the chest should be aspirated and pneumothorax introduced. When the foreign body moves with the lung, it is intrapulmonary; when it remains stationary, it is in the chest wall. Foreign bodies about the diaphragm are notoriously difficult to locate accurately, and it is sometimes necessary to induce a diagnostic pneumoperitoneum to be sure about their exact location. Once pneumoperitoneum has been induced, posteroanterior and lateral upright x-rays are essential, with oblique and lateral decubitus views frequently necessary. If these studies produce even one view showing the foreign body above the diaphragm, then the missile must be intrathoracic and not subdiaphragmatic.

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[6] Burbank, B.; Burford, T. H.; Samson, P. C., and Mesirow, S.: Experience in the Localization of Thoracic Foreign Bodies, J. Thoracic Surg. 15: 64-75 (Feb.) 1946.

A spontaneous pneumoperitoneum is absolute evidence of a ruptured abdominal viscus and should be carefully ruled out before pneumoperitoneum is introduced for diagnosis. Moreover, with any indication of intra-abdominal infection, diagnostic pneumoperitoneum should not be used.

Cardiac fluoroscopy is particularly valuable in the diagnosis of cardiac tamponade. The routine roentgenogram of the chest can show a large cardiopericardial shadow with sharply defined edges. However, fluoroscopic examination will generally clarify the cardiac diagnosis, because there will be diminution or absence of pulsations in the cardiac silhouette.

Other diagnostic methods may give valuable information. By thoracentesis one can determine the presence of air or blood in the pleural cavity, and the intrapleural pressure can be measured if a pneumothorax exists. Paracentesis may be valuable in the diagnosis of intraperitoneal hemorrhage. The patient should be catheterized if he has not voided since his accident, so that one may determine whether damage to the urinary tract has occurred.

EARLY OPEN THORACOTOMY

When the patient has been adequately prepared and treated for shock and proper methods have been used to obtain an accurate diagnosis, then the surgeon must decide whether immediate emergency surgery is indicated. Certain criteria will help one in making the decision. When there are multiple injuries, the location of the injuries besides the chest injuries will influence his judgment. Chest injuries requiring surgery may be cared for immediately even when they coexist with injuries to the head or extremities, for, in general, head injuries are best treated conservatively and injuries to the extremities can be splinted and operation deferred. However, when a chest injury is complicated by an abdominal injury, both the chest and abdomen should be operated on at once.

Thoracoabdominal Injuries.—Thoracoabdominal injuries present difficult diagnostic problems. We agree with Betts [7] that, if a thoracoabdominal injury seems probable, exploration must be done. The diagnosis of a perforation of the diaphragm in a penetrating chest wound is less difficult that that of a crushing injury, because the course of the missile facilitates the diagnosis. Mackler [8] said that in none of his cases had the pathway of a bullet ever deviated from a straight line through the body.

In crushing injuries, the diagnosis must be based on the results of physical examination. A patient with a rigid abdomen generally has an abdominal injury, although the rigidity may be due to reflex spasm. Absence of bowel sounds indicates a bowel injury; but bowel sounds may be present with bowel injury, so that the sign is not entirely reliable. Pneumoperitoneum can be demonstrated roentgenographically, and its presence is sufficient indication for immediate surgery. Blood obtained by paracentesis is also an indication for operation. However, if no blood is obtained by paracentesis, intra-abdominal hemorrhage cannot be excluded.

When there is a thoracoabdominal injury, the thoracotomy should be performed before, rather than after, the abdominal procedure, even though a thoracotomy would not be imperative in the absence of the abdominal injury, because as Wylie and his associates [9] state a balanced cardiorespiratory system is important in combating shock. Surgery in the abdomen is much safer after the injury to the lung has been repaired and the lung expanded.

Because most thoracoabdominal injuries involve the upper part of the abdomen, the surgical approach in these injuries should be through the chest. If the injury is on the right side, the lung should be sutured, the diaphragm and abdominal injuries repaired, and the liver area drained by a subcostal drain.[8] If the abdomen cannot be explored satisfactorily because of the presence of the liver on the right side, the incision can be extended across the costal margin. Another method consists of repairing the diaphragm and lung, closing the chest incision, and making another incision in the abdomen. On the left side, a thoracic incision with opening of the diaphragm gives an excellent exposure to the upper part of the abdomen and can also be extended across the costal margin.[10] After a thoracic approach, tubes are inserted for underwater seal suction drainage to insure reexpansion of the lung (see the accompanying figure).

Cardiac Injuries.—Penetrating wounds of the heart may produce cardiac tamponade. Moore [11] expressed the belief that 200 cc. of fluid in the normal pericardium is enough to cause circulatory failure. Skinner and his associates [4] outlined the following diagnostic signs: 1. There is venous back pressure, which can be observed in distention of the neck veins and a dusky cyanosis. 2. The pulse pressure is markedly narrowed, to about 10 mm. of mercury, even before the blood pressure falls to shock levels. 3. The heart sounds are distant or inaudible. 4. The heart rate is not fast. A decrease in the motion of the cardiac silhouette observed fluoroscopically confirms the diagnosis.

In the presence of cardiac tamponade, surgery is urgent but should be done under sterile conditions. While the operating room is being readied, the pericardium may be aspirated. The heart is best approached transpleurally through the fifth intercostal space. After the laceration in the heart has been sutured, the pericardium is left open, so that it will drain into the pleural cavity.

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[7] Betts, R. H.: Initial Surgery of Thoracoabdominal War Injuries, J. Thoracic Surg. **15**: 349-364 (Oct.) 1946.

[8] Mackler, S. A.: Experience with Thoracic and Thoracoabdominal Wounds in an Evacuation Hospital, J. Thoracic Surg. **16**: 538-570 (Oct.) 1947.

[9] Wylie, R. H.; Hoffman, H. L.; Williams, D. B., and Rose, W. F.: Thoraco-abdominal Casualty, Ann. Surg. **124**: 463-478 (Aug.) 1946.

[10] Harper, F. R.: Thoracicoabdominal Approach to the Upper Abdomen, Surg., Gynec. & Obst. **84**: 331-332 (March) 1947.

[11] Moore, R. L.: War Injuries of the Chest, Ann. Surg. **124**: 367-382 (Aug.) 1946.

Thoracic Injuries.—Immediate surgery for chest injuries alone is seldom necessary. Most chest injuries are best treated conservatively at first, with definitive surgery later. However, some conditions demand immediate emergency surgery.

1. Large open chest wounds require emergency thoracotomy with débridement of the wound and closure of the sucking wound. In these wounds it is generally possible to inspect and suture the underlying lung at the time of surgery. Betts and Lees [12] stated that all open chest wounds over 6 cm. in diameter should be operated on immediately. At the completion of any open thoracotomy the chest is drained by under water seal suction drainage to reexpand the lung (see the accompanying figure).

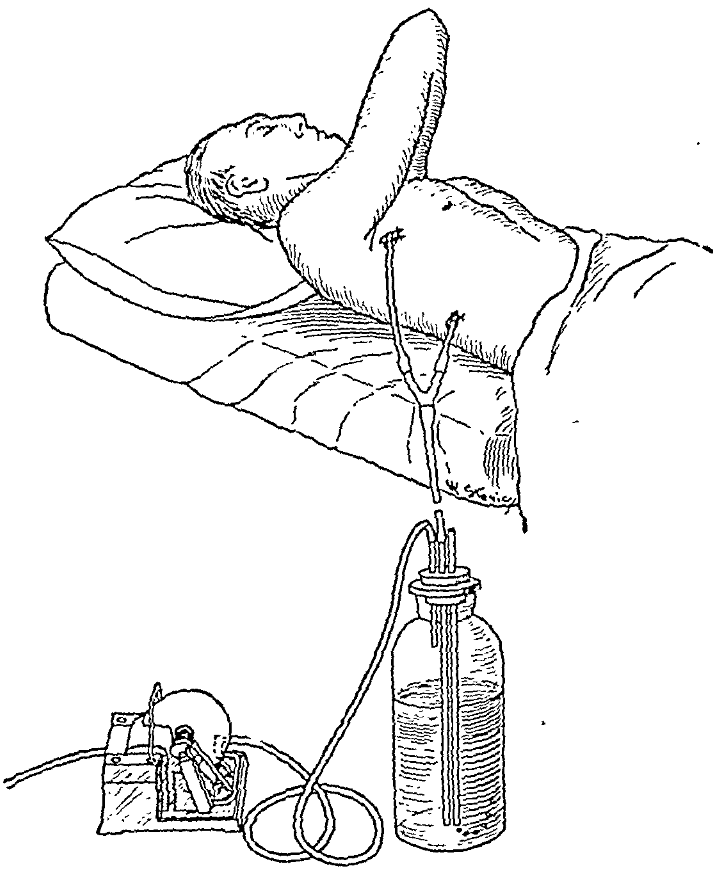

Diagram of negative pressure apparatus used by us. The Steadman pump, together with the free tube under water, creates a constant negative pressure depending on the depth of the water. The method may be used in tension pneumothorax or after open chest operations.

2. Massive hemorrhage into the chest following either penetrating or closed injuries constitutes an emergency. Severe intrapleural hemorrhage is generally from one of the systemic vessels; intercostals, internal mammaries, or pericardiophrenics may be the source. Betts and Lees [12] observed that the only vessels they had seen actually bleeding at the time of thoracotomy were intercostals that were incompletely divided and hence unable to retract. Jagged rib fragments in the lung can be the source of continued bleeding if they become embedded in lung tissue and prevent the sealing off of the peripheral pulmonary vessels. Chest aspirations should be repeated when the patient is not recovering from shock. If these repeated aspirations indicate continued bleeding, open thoracotomy should be done at once to determine and control the source of bleeding.

3. Ruptured trachea, bronchus, or esophagus, in fact any injury obviously involving the posterior mediastinum, should receive early operation. Rupture of the trachea or bronchus may occur in penetrating or crushing chest injuries. Kinsella and Johnsrud [13] reviewed the literature on ruptured bronchus and found that pneumothorax of varying extent frequently develops. Emphysema may be slight or extensive and is dangerous when it results from bronchial rupture within the mediastinal pleura. Complete or nearly complete bronchial occlusion occurs, with resultant atelectasis if the patient survives. In some cases of ruptured bronchus, there is tension pneumothorax that cannot be controlled by intercostal catheter drainage and requires immediate thoracotomy.[14] Diagnosis of esophageal injury is difficult. Shefts and Doud [15] found that dysphagia was not a reliable symptom but that severe back pain radiating down into the lumbar region was a constant complaint and was unrelieved by administration of large doses of morphine. When this injury is suspected, the patient can be given a swallow of iodized oil before fluoroscopic study of the chest. The surgical approach should be either posterolateral transpleural or posterior mediastinotomy.

4. A flaccid chest wall due to multiple rib fractures, both anterior and posterior, keeps a patient in shock. One should treat a patient with this condition by strapping, placing him on the injured side, or traction on the rib fragments with towel clips and weights. When none of these methods is successful and the patient remains in shock, the chest should be opened and internal fixation attempted. Complete reexpansion of the lung by negative pressure from under water seal suction drainage will do much to stabilize the cardiorespiratory system.

NONOPERATIVE TREATMENT

Hemopneumothorax may develop after either penetrating or crushing chest injuries. A needle is inserted in the pleural cavity to aspirate blood and air from patients with this condition, and a monometric reading is taken. When the monometer shows that the intrapleural pressure is negative, the lacerations of the lung are sealed and the lung will expand. Repeated aspirations without air replacement are all that is needed. On the other hand, when the monometric reading is positive, the lacerations of the lung are not healed, and a tension pneumothorax has developed. Such a collapsed lung must be reexpanded as soon as possible by insertion of an intercostal catheter attached to under water seal suction.

Rib fractures are the most frequent chest injury. Strapping with adhesive tape has been a common treatment for this condition but should be condemned, because it limits chest expansion and prevents proper aeration. The best treatment is repeated injection of the intercostal nerves with procaine hydrochloride. This relieves the pain and permits normal chest excursions.

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[12] Betts, R. H., and Lees, W. M.: Military Thoracic Surgery in Forward Area, J. Thoracic Surg. **15**: 44-63 (Feb.) 1946.

[13] Kinsella, T. J., and Johnsrud, L. W.: Traumatic Rupture of the Bronchus, J. Thoracic Surg. **16**: 571-583 (Oct.) 1947.

[14] Scannell, J. G.: Rupture of the Bronchus Following Closed Injury to the Chest: Report of Case Treated by Immediate Thoracotomy and Repair, Ann. Surg. **133**: 127-130 (Jan.) 1951.

[15] Shefts, L. M., and Doud, E. A.: Management of Thoracic and Thoracoabdominal Wounds in Forward Areas in Sicilian and Italian Campaigns, J. Thoracic Surg. **15**: 205-223 (June) 1946.

Subcutaneous emphysema frequently develops in chest injuries and is generally not a serious complication. When pleural adhesions prevent a pneumothorax from forming, the subcutaneous emphysema may become extensive. In these severe conditions it is necessary to make multiple incisions where the air has collected, to allow the air to escape. Mediastinal emphysema may follow a crushing injury. This diagnosis is made by x-ray and observation of a peculiar crackling sound of the heart beats. Extensive mediastinal emphysema is relieved by superior mediastinotomy. In all cases of emphysema, antibiotics should be given.

LATE OPERATIONS FOR CHEST INJURIES

As we mentioned before, most patients with hemopneumothorax can be treated with repeated aspirations of the pleural cavity. In a few patients, immediate thoracotomy will be necessary because of massive hemorrhage. In a third group, clotting of the hemothorax occurs. Tuttle and his associates [16] placed the incidence of intrapleural clotting at 5% to 10% in civilian wounds and 15% to 20% in war wounds. According to Langston and Tuttle,[17] if clotting is to occur, it can usually be detected in three to five days after the injury. The detection of clotting is dependent on the surgeon's inability to aspirate blood from the chest when x-ray and physical examination indicate its presence. If clotted blood is allowed to remain in the pleural cavity without treatment, the lung will fail to reexpand, and in many cases chronic empyema will develop.

This clotted hemothorax can be treated in two ways. In the early stages 150,000 units of streptokinase and 60,000 units of streptodornase can be injected into the pleural cavity.[18] Twenty-four hours later the chest is aspirated. The treatment is repeated within a few days as often as it is effective. If the treatment is effective, the clot becomes liquefied and the lung will reexpand. The desired results are not accomplished in all patients. Furthermore, as more time has elapsed the treatment with streptocolysins is less liable to be successful. A contraindication to this treatment is the presence of a bronchopleural fistula, because of the danger of contralateral pneumonitis.

The other method of treatment is open thoracotomy with decortication. Decortication became popular during World War II. The operation consists of opening the chest and removing blood clots and then dissecting the organized peel from the pleural surface. At the completion of the operation, the lung is reexpanded and kept expanded with underwater seal suction drainage. Samson and his associates [19] stated that, from a purely technical point of view, decortication is best performed three to five weeks after injury. If it is performed less than two weeks after injury, the peel is thin and friable and the operation tedious because the poorly defined membrane must be removed piecemeal or painstakingly wiped from the pleural surface. When decortication is performed too late, probably after 10 to 14 weeks, the fibrous union between peel and pleura is often so firm that a proper cleavage plane cannot be established. Opinions vary as to whether it is necessary to remove the peel from the diaphragmatic and parietal pleura. We remove all of the peel if it is technically feasible.

Other late operations on the chest may be done for the removal of foreign bodies. Small metallic foreign bodies should not be routinely removed. However, irregularly shaped foreign bodies, foreign bodies over 1½ cm. in diameter, foreign bodies lying near important structures, and intraventricular foreign bodies should be removed by open thoracotomy as an elective procedure.

With present methods of treatment, empyema will develop in few patients after chest injuries. We have omitted detailed discussion of the treatment of empyema. However, in general, when a patient is very septic or has putrid empyema, drainage should be instituted at once. Other methods of treatment consist of the use of streptokinase and streptodornase [20] and decortication of the empyema cavity to accomplish reexpansion of the lung.

HOSPITAL CARE OF PATIENTS WITH THORACIC INJURIES

Patients with chest injuries, whether receiving surgical or nonoperative treatment, require careful supervision. Frequent blood pressure readings help in the detection of early shock, mediastinal shift, or tracheobronchial obstruction. Increase in the pulse rate is generally the first indication of beginning atelectasis, which should be treated vigorously. The patient should be encouraged to cough once an hour; expectorants, such as sodium iodide in doses of 1 gm. twice a day, should be administered, and catheter aspiration of the tracheobronchial tree or bronchoscopy should be done if the atelectasis persists.

Pulmonary edema or wet lung following trauma has been the subject of much discussion. Daniel and Cate,[21] in an experimental study, found that infusions of sodium chloride, hypoxia, and reflex phenomenon are all factors in the production of pulmonary edema. Prevention appears to depend on avoiding sodium chloride infusions, maintaining a clear airway, administering oxygen, and blocking nerves.

Oxygen is important in the management of chest injuries and should be administered according to a definite plan. Nasal oxygen is the method of choice, because more oxygen is delivered than with a tent and the nursing problem is simpler. Nasal oxygen must be kept moist by bubbling the gas through water, and the catheter should be removed and cleaned every three or four hours, to prevent crusted secretions from plugging it. Oxygen therapy should be discontinued if possible after 36 hours, because prolonged use of oxygen predisposes to atelectasis by decreasing respiratory excursions and by drying the secretions in the tracheobronchial tree.

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[16] Tuttle, W. M.; Langston, H. T., and Crowley, R. T.: The Treatment of Organizing Hemothorax by Pulmonary Decortication, J. Thoracic Surg. **16**: 117-126 (April) 1947.

[17] Langston, H. T., and Tuttle, W. M.: The Pathology of Chronic Traumatic Hemothorax, J. Thoracic Surg. **16**: 99-116 (April) 1947.

[18] Read, C. T., and Berry, F. B.: The Utilization of Streptokinase-Streptodornase in Patient with Hemopneumothorax and Patient with Post-pneumonectomy Sanguineous Coagulum, J. Thoracic Surg. **20**: 384-392 (Sept.) 1950.

[19] Samson, P. C.; Burford, T. H.; Brewer, L. A., III, and Burbank, B.: Management of War Wounds of the Chest in a Base Center: Role of Early Pulmonary Decortication, J. Thoracic Surg. **15**: 1-30 (Feb.) 1946.

[20] Tillett, W. S.; Sherry S., and Read, C. T.: The Use of Streptokinase-Streptodornase in the Treatment of Chronic Empyema, with Interpretive Discussion of Enzymatic Actions in Field of Intrathoracic Diseases, J. Thoracic Surg. **21**:325-341 (April) 1951.

[21] Daniel, R. A., Jr., and Cate, W. R., Jr.: "Wet Lung"—an Experimental Study: Effects of Trauma and Hypoxia: Neurogenic Factor, Ann. Surg. **127**: 836-857 (May) 1948.

CONCLUSIONS

Most patients with chest injuries will live if the patients are properly handled from the time the injury occurs. The importance of training ambulance and admitting room teams in first aid methods peculiar to chest injuries is stressed. The necessity of early operation in thoracoabdominal injuries is emphasized. The importance of a knowledge of the methods of maintaining a clear airway in all patients with chest injuries is fundamental. The observance of certain principles in cardiorespiratory function in patients with chest injuries will save many lives.

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ACUTE HEAD INJURY

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The subject of acute head injury is of ever increasing importance, paralleling the increasing tempo of our mechanical age. By all odds, the best treatment of acute head injury is preventive. Prevention implies constant and unrelenting effort to propagandize the dangers of high speed. The extent and severity of brain injury are determined at the moment of impact of the head against an unyielding object. Should the resultant force be relatively slight, the injury will be slight and the recovery, in all likelihood, prompt and devoid of sequelae. Should the impact on the head be severe, serious, perhaps irremediable, damage to the brain will result, or death may ensue. Hence, education designed to eliminate, as far as possible, the hazards of high speed life is important. But granted that injury has occurred, every physician must then face the immediate problem of attempting to lessen the resultant damage. Those who deal with such problems frequently can meet the situation with familiarity and relative ease. It is for the physician who sees such injuries infrequently and who is less often called on to analyze the problems involved that this paper is intended.

Any case of head injury involves one or more of four elements concerning the head proper. It is the physician's responsibility to analyze the immediate problem in relation to these various potentialities. The person who has sustained a head injury may be suffering from trauma of the scalp, from skull fracture, from one of the various forms of meningeal hemorrhage, or from injury to the brain, or he may be suffering from a combination of these injuries, with or without significant disturbance of the general physiology of his body.

Injuries to the scalp are obvious lesions, the recognition of which involves no particular complexity of thinking but whose seriousness may be overlooked if one fails to recognize the exsanguinating potentialities of extensive scalp injuries, a reflection of the abundant vascular supply of the scalp, or if one fails to consider seriously the protective function of the dermal layer and of the highly developed aponeurosis in relation to infection. Both of these sheet-like structures comprise effective barriers against infection of the deeper layers of the scalp. Space will not permit a detailed consideration of treatment of scalp injuries, but the importance of surgical cleanliness, of wide shaving of the scalp, and of the application of good general surgical principles is self-evident.

The second category of acute head injuries is that of skull fracture. Linear and comminuted fractures of the skull are of importance only when they tear major vascular channels, such as the middle meningeal artery or the larger venous sinuses, when they tear cranial nerves, or when they cause compounding of the wound, as when a linear fracture enters the frontal sinus or the ethmoid cells or opens the middle ear. Under these circumstances, infection may enter the intracranial cavity and give rise to meningitis or brain abscess. In general, the last group, with "hidden" compounding, requires the use of sulfonamides and antibiotics to prevent infection. Relatively little can be done for torn cranial nerves. Treatment in the first group depends on the active handling of the meningeal hemorrhage resulting from the tear of a particular vessel, a subject that will be discussed later.

Depressed fractures usually require elevation, which is more important when the depression is extensive or when it lies in relation to functionally important areas of the brain, such as the sensorimotor cortex or the speech mechanisms of the dominant hemisphere. Compound wounds associated with skull fractures must of course be handled with reference to general surgical principles. In this paper emphasis will be placed on the various forms of meningeal hemorrhage, since it is these forms of injury for which definitive therapy is most clearly evident and in which, if definitive therapy is neglected, the greatest damage will result.

There are three forms of meningeal hemorrhage, two of which, epidural and subdural hemorrhage, are of special importance. For all practical purposes, these two types of space occupying lesions may be regarded as essentially similar if certain qualifications are imposed at the onset. Accumulations of blood occur either on the outer or the inner side of the dura. The outer side of the dura is closely affixed to the undersurface of the skull, and it is in the outer layer of the dura that the meningeal vessels run. If, as a result of trauma, one of the meningeal vessels is torn, blood begins to accumulate in the epidural space. Accumulation may continue because the bleeding is under arterial pressure. Thus, the dura may be stripped from the undersurface of the skull, and, in a relatively short time, perhaps 15 to 30 minutes, a significant amount of blood may accumulate, the dura being stripped from the undersurface of the skull in a relatively restricted area. Such bleeding usually arises from the middle men-

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ingeal vessels, and, as a result, such clots usually lie in the temporoparietal region.

The second possibility of bleeding in relation to the dura is the subdural hematoma. The subdural space is a potential cavity that covers the entire convex surface of the hemisphere. Thus, blood that escapes into the subdural space results in a hematoma that is generally more extensive than the epidural hematoma, for there are no restraints against its spread over the hemisphere. The acute accumulation of blood in the subdural space may result either from the tearing of superficial vessels, arterial or venous, as they traverse the cortex or from the tearing of major venous channels leaving the surface of the brain and entering the large dural sinuses. These thin-walled vessels, draining the surface of the brain, must, to reach the sinuses, traverse the subdural space, and, being fixed at their points of entry into the sinuses, although free over the cortex to move with the brain, they may readily be torn if a movement of the brain within the skull case is of undue proportion.

The brain has a remarkable capacity to adjust itself to space occupying lesions, provided these lesions develop slowly; however, adjustments that must be made in 15 minutes, a half hour, or an hour are not well tolerated by the brain. Not only is the brain shifted unduly by the hemorrhage, but, under such circumstances, there are secondary circulatory disturbances occurring in the portion of the brain underlying the hematoma, which lead to swelling of the underlying hemisphere. This compounds the difficulty further, and, if the clot is not evacuated, serious sequelae and even death may result.

The physician may recognize such accumulations, with their impending threat to normal function and survival by the following symptoms and signs. In most instances, there will be signs of injury about the head, even though the patient may not be able to provide historical data, as it is possible that the initial injury may cause protracted unconsciousness. In some instances, however, consciousness may be recovered after the blow. Drowsiness and progressively deepening coma after a head injury are always signs of grave significance. Then, since epidural clots are almost always unilateral and acute subdural clots are frequently unilateral, there may be evidence of dysfunction of the underlying hemisphere, manifested by unilateral paresis, which proceeds to paralysis.

The shift of the brain stem, which is an extremely important accompaniment of the space consuming action of the clot, may produce signs of pupillary inequality, usually produces dilatation on the side of the lesion, and sometimes produces signs of midbrain disturbance, characterized by decerebrate rigidity, generally coming on in waves and frequently precipitated by external stimuli, such as handling of the extremities by the examiner.

An excessive amount of blood may accumulate within a fraction of an hour, or an hour or two; thus, if the bleeding is rapid and massive, the physician must be prepared to make sure that the offending clot is removed at the earliest opportunity. Disturbance of function develops most frequently within a few hours or less in the case of epidural hematomas, and irreparable damage results if the condition is not recognized and treatment is not promptly instituted.

Sometimes, subdural accumulations of blood develop less rapidly and are less extensive if tamponade closes the venous channels relatively early. Such clots are tolerated during the acute period following the injury and manifest themselves only days, weeks, or even months later. The subacute and chronic subdural hematomas are problems that cannot be discussed within the limits of this paper.

The third type of meningeal bleeding, subarachnoid hemorrhage, may be discussed briefly, since it is not of surgical importance. The subarachnoid space is, from the surgical point of view, inaccessible, and, in any event, surgical drainage is not valuable because the reticuloendothelial lining of these spaces provides hosts of phagocytes that are readily mobilized during hemorrhage and which, in the course of days, dispose of the extravasated blood in a more efficient manner than has been conceived of surgically.

The fourth general category of head injuries, brain injury per se, cannot be extensively treated in this paper. One should, however, point out certain basic principles. The disturbance of brain function resulting from direct transmission of force to the brain presumably represents a physical disruption of the structural and, therefore, the conducting integrity of the nerve cells; or it may represent a secondary effect, dependent on disturbances of circulation resulting from the transmission of lines of force to the blood vessel walls, with the production of vasoparesis, with its associated nutritional disturbances and, therefore, disturbances of conduction. In either event, the degree of disturbance of normal brain function depends on the extent and the severity of interference with normal conduction.

Interference with consciousness is immediate or delayed. Sufficiently sudden acceleration or deceleration of the head results in sudden loss of consciousness. In this instance, it seems that nerve cell conduction is immediately and profoundly disturbed in those centers subserving the waking state, centers that physiological studies suggest lie at the midbrain and upper brain stem levels. It seems logical to concur in the generally accepted hypothesis that such dysfunction is the result of a disruption of the physical integrity of the nerve cells, a disruption from which recovery usually takes place quickly, in seconds or minutes. Other brain stem mechanisms may be concurrently disturbed; thus, vomiting, dizziness, and pulse and blood pressure alterations may be manifested early in persons who have had this form of transient loss of consciousness, to which the term concussion properly applies.

A second form of immediate loss of consciousness is that which occurs in injuries in which the head may not be directly involved. Grave general bodily injury, such as fracture of the femur, is often associated with immediate and transitory loss of consciousness. In this instance, it seems likely that a sudden influx, in a massive quantity, of afferent impulses from the periphery is delivered to the centers of consciousness, disrupting their function.

A third possible mechanism is that in which physical injury, either direct and immediate, as in brain stem contusion, or indirect and delayed, as in secondary brain stem hemorrhage, impairs function.

Finally, the fourth mechanism is delayed and is dependent on increased intracranial pressure. As the result of studies of head injury carried out for the Army, I have concluded that the importance of this mechanism has been grossly overrated. Continuous records of patients whose pressure-volume relationships have been studied demonstrated conclusively that pressures as high as 1,400 mm. of water, induced by the addition of fluid to either the lumbar subarachnoid or the ventricular spaces, and well above those commonly associated with head injury, are not accompanied by alterations in consciousness. The final step in the demonstration, raising the pressure to heights exceeding the diastolic pressure, has, for obvious reasons, not been done on human beings, but clinical experience clearly indicates that, at such critical levels, consciousness will be lost, presumably because of ischemia of the centers subserving consciousness. Conceivably, there are instances in which such pressure becomes of clinical significance, but these instances, if existent, must be relatitvely rare and are not of general importance.

Other forms of acute brain injury fall into the category of cerebral edema and of contusion, laceration, and intracerebral hematoma formation. The clinical importance of edema, other than that which develops under meningeal clots, seems to me to be doubtful. It might produce disturbance, either through pressure, local or generalized, or through interference with conduction. I do not believe that it produces general increases in pressure of a degree sufficient to be significant. Edema may, however, be important when it contributes to a shift of midbrain structures, as, for example, when it develops beneath an acute epidural hematoma. Whether edema of a vital area such as the midbrain is of itself a significant deterent to conduction and, therefore, to proper function or whether it merely signals a more basic physiological disturbance that produces a conduction deficit has not been determined.

With the exception of intracerebral hematomas, the treatment of brain injuries in the light of present knowledge involves the sustaining care that is applicable to all forms of injury, care that is designed to protect general bodily function: the establishment and maintenance of an adequate airway, by tracheotomy, if necessary; the rectification of surgical shock, if present; the correction of hyperthemia, with its excessive demand for oxygen; the maintenance of an adequate fluid and caloric intake; attention to bladder and bowel; prevention and elimination of infection; and rest and quiet, achieved, if necessary, through the judicious use of sedatives. Finally, as recovery ensues, the physician has the responsibility of providing reassurance and supervising rehabilitation. Analysis of repeated electroencephalographic tracings may aid in assessing prognosis.

In discussing brain injury per se, special attention must be devoted to the handling of intracerebral hematomas, which may result from tearing vessels within the cerebral substance, from rupture of preexistent vascular anomalies, and, probably, also from the coalescence of multiple petechial hemorrhages. When such clots are sizable, their surgical removal is imperative. How are they to be recognized? Since they act as other space occupying lesions the clinical picture is often little different from that presented by epidural and subdural hemorrhage. Hence, deepening levels of unconsciousness, hemiparesis, pupillary alterations, and signs of midbrain dysfunction may, one or all, be manifestations of intracerebral bleeding.

From the practical point of view, I believe that the complete investigation of any case of suspected hematoma formation—epidural, subdural, or intracerebral—necessitates multiple exploratory openings in search of meningeal hemorrhage. When a satisfactory explanation of the clinical condition is not found on exploration of the epidural and subdural spaces, one should proceed to investigate, through angiography or ventriculography, or both, the possibility of intracerebral hematoma formation. In my opinion, it is only in this way that the patient is studied completely and the possibility of adequate surgical handling is achieved. Should the studies reveal no clot, the treatment consists of the supporting measures outlined above.

SUMMARY

The physician's responsibility is to analyze the multiform and complex problem presented by the patient suffering from head injury, and, from his analysis, decide which of the many factors cited above are operating in the individual case. After such artificial fractionation of the problem, a synthesis must be made that will direct therapy. Surgical possibilities for the treatment of scalp injuries, certain types of skull fractures, and the evacuation of possible intracranial hematomas must be seriously weighed and investigated with the aid, if necessary, of ventriculography and angiography, and prompt and accurate evacuation must be performed when indicated.

In treating the remaining types of brain injury, general supportive measures are to be instituted as outlined above. Except as an indication of disturbed physiological processes, increased intracranial pressure is not, in my opinion, of grave moment and does not, of itself, constitute a therapeutic indication. There is need for a better understanding of the disturbed metabolism of nerve cells secondary to injury, so that a more rational treatment of such disturbed metabolism may be developed.

Economic Effects of Malaria.—The effect of malaria on a community may mean anything from a slight inconvenience to an almost complete cessation of individual and community activities. In the milder degrees of malarial endemicity the chief effect will be in the form of days lost to all beneficial activities on account of illness among the workers. This effect may be much greater than would be expected from the number of days lost, especially in tropical communities where as Macdonald has pointed out, the success or otherwise of agricultural operations often depends on the climatic conditions obtaining during a limited part of the year, generally that part when ploughing and sowing are carried out. If the sickness among the population coincides with this period the days lost and the impaired physical condition of the workers will have an effect on their productive capacity the results of which will endure throughout the remainder of the year in a way which would not have been the case had the malaria been prevalent at a less important part of the annual work cycle.—H. E. Shortt, M.D., The Impact of Protozoa on World Economic Problems, *British Medical Journal,* Nov. 10, 1951.

ABNORMAL VAGINAL BLEEDING

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Cancer of the genitalia kills more women than any other type of cancer. The mortality rate from cancer of the uterus alone is 12.7 per 100,000 population, a loss of 20,000 lives in the United States. The general practitioner is the first to see the majority of cancer patients. Early diagnosis of carcinoma might result in the prevention of 75% of these 20,000 cancer deaths. Cancer of the genitalia is manifested early, in the majority of patients, by abnormal vaginal bleeding. If physicians follow a few routine steps, they are unlikely to gloss over early carcinoma of the uterus as a mere menopausal symptom. The purpose of this paper is to offer a simplified outline of procedure that will enable physicians to reduce materially the ravages of carcinoma of the uterus.

There are many lesions, other than carcinoma, that are manifested by abnormal vaginal bleeding. Blood dyscrasias, vitamin deficiencies, ovarian cystomas, organic heart disease, and many other pathological processes make their first appearance with a change in the menstrual pattern. The change in the flow is characterized by menorrhagia, metrorrhagia, amenorrhea, or oligomenorrhea. For the most part, this paper will be confined to the more serious indications of disease, menorrhagia and metrorrhagia.

This paper will principally concern clinical problems. All specialists have an intense interest in this problem, but the general practitioner is the most important link in obtaining an early, correct, and complete diagnosis. A general discussion of some of the commoner causes of organic and functional disorders will be made, with particular emphasis on division into age groups. The most likely causes of bleeding at each particular period will be discussed.

To cause bleeding, organic disease can be benign or malignant, local or general. The general bodily disturbances can be dismissed with the thought that there are other than local causes for profuse menstruation. Functional uterine bleeding is typically exemplified by those menstrual disorders that occur in adolescence and at the menopause. If a definite organic or endocrine cause cannot be found, the bleeding is functional. Unfortunately, this category is too large. The list of medicaments used in remedying functional disorders is also too large and encompasses almost everything in the pharmacopeia. The connotation of excessive bleeding is entirely different in the adolescent than it is in the postmenopausal woman. From birth to puberty or the menarche, there are few instances of vaginal bleeding. A carry-over of estrogens from the maternal organism will cause vaginal bleeding and enlargement of the breasts in some female babies. In the older child, foreign bodies in the vagina are often offenders. Novak,[1] among others, has described precocious puberty in the young girl. These children, who range from 6 to 12 years of age, become young ladies in appearance and mental status and, occasionally, menstruate functionally, ovulate, and reproduce.

From the menarche to the reproductive period, there are frequent menstrual disorders of an inconsequential nature; anemia, hypothyroidism, blood dyscrasias, avitaminosis, and inadequate diet are often the responsible factors. Small doses of thyroid and other supportive therapy usually remedy this condition. Occasionally, repeated dilatation and curettage, transfusions, and even hysterectomy are required as a life-saving measure.

In the reproductive age group, there are more instances of hormonal imbalance and organic diseases that cause abnormal bleeding. The complications of pregnancy are among the commonest. Cervical polyps, endometriosis, eroded lacerated cervices, infection (tubal, vaginal, or cervical), uterine fibromyomas, and broad ligament varicosities are noted. Endocrine dysfunctions are found in conjunction with disturbed relationships in the pituitary, thyroid, or ovarian endometrial pattern; this results in anovulatory bleeding, incomplete shedding of the endometrium, and endometrial hyperplasia.

In the late reproductive or premenopausal age group, the incidence of carcinoma of the cervix begins to rise. In treating women in this group, the physician must develop a cancer consciousness that will enable him to discover early, curable lesions. An early cancer cannot always be palpated with the gloved finger or seen with the naked eye. During the menopause, there is a continuation of most of the above-mentioned conditions, with the addition of functional bleeding disorders. Menstrual abnormalities and irregular bleeding are not natural during the menopause. Accurate diagnostic studies must be made to determine the cause of the bleeding.

After the menopause, the increasing incidence of malignant growths becomes overwhelming. The early malignant growth, which, according to recent studies, probably goes undetected for many years, at this time becomes more evident, easier to diagnose, and more difficult to treat successfully. The incidence of malignant growths in the postmenopausal years, as signified by vaginal bleeding, varies from 25% to 75% of all patients, depending on the clinic reporting. The true figure is probably between 40 and 50%. Some of the commoner benign causes are polyps, fibromyomas, senile vaginitis, urethral prolapse and caruncle ovarian cystomas, and atrophic cystic endometriums.

The results of my study of 227 clinical histories are given in the table. Unless the cause of bleeding was either organic or endocrine, the patients, including those with pregnancy complications were listed under the functional heading. These charts were reviewed at the California Hospital and from clinical practice over a period of three years. The age variation is from a few days to 91 years.

There is a definite preponderance of functional uterine bleeders. The term is not satisfactory, but there is no better way to group those patients who bleed for no apparent reason. Psychogenic factors are responsible for more functional bleeding than most physicians realize.

In the reproductive age group, functional uterine bleeding still occurs most commonly. Pregnancy and its

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[1] Novak, E.: Gynecological and Obstetrical Pathology with Clinical and Endocrine Relations, ed. 2, Philadelphia, W. B. Saunders Company, 1947, pp. 406-407.

complications were the second most likely diagnosis, and this was followed by uterine fibromyomas, cervical disease, and endometriosis. In the menopausal group, organic disease was the most prevalent; this was closely followed by functional bleeding. The misuse of estrogens caused almost as many abnormal bleeding problems. The postmenopausal age group was comprised of those patients in whom there had not been a regular period for at least one year. Malignant growths were found on 38% of this group. The misuse of estrogens caused considerable tension and necessitated complete studies with dilatation and curettage and biopsy to determine the true cause of the bleeding.

Therapy for those patients with abnormal genital bleeding varies from watchful waiting to total hysterectomy and bilateral salpingo-oophorectomy. When there are multitudes of "sure cures" for a medical entity, there is usually no one completely satisfactory method. The following simple outline of treatment is suggested.

A complete physical examination should be made, with a complete blood cell count and a determination of the bleeding and clotting time. A meticulous local examination of the vulva, vagina, cervix, and uterus is mandatory. No pelvic examination is complete until the cervix is visualized through a speculum, in good light.

TABLE 1.—*Causes of Vaginal Bleeding in 227 Cases*

Age Group	Functional	Organic	Endocrine
Birth to puberty	1	1	2
Adolescence	23	2	4
Reproductive	59	31	11
Menopausal	17	18	13
Postmenopausal	14	17	14
	114	69	44

Determination of the basal metabolic rate, blood iodides, and other pertinent laboratory work is often helpful.

Endocrine therapy is effective in treating the majority of cases of the nonorganic bleeding; one of the most reliable of these glandular products is thyroid. In the adolescent, and often during the reproductive period, small doses of thyroid will regulate the menstrual cycles. Pituitary extracts and anterior pituitary-like hormones are used. The three commonest endocrines in use today are progesterone, estrogen, and testosterone propionate with its esters. Large doses of estrogens have been the favorite means of controlling nonorganic bleeding. Oral estrogens such as diethylstilbestrol may cause nausea and vomiting; however, this medication can be injected, or other less toxic estrogens for oral administration, such as premarin® (estrogens derived from pregnant mares' urine) or ethinyl estradiol, may be used. Once the bleeding has stopped, cyclic therapy, as advocated by Hamblen,[2] may be instituted to regulate the periods.

Testosterone propionate has given good results. The initial dose, usually 25 to 50 mg., may be given subcutaneously, and oral linguets® (tablets to be dissolved sublingually), 10 mg., may be started at the same time. The dosage is gradually reduced as the bleeding is controlled. To avoid masculinization effects, more than 300 mg. a month should not be given. Progesterone is said to create a "nonsurgical curettage," and a bleeding period usually follows withdrawal of the hormone. The dosage schedule varies with the individual, and the medication can be given orally or by injection. From the standpoint of economy, ease of administration, and rapidity and certainty of action, many gynecologists have found that estrogens and male hormones are most effective; results with progesterone have been uncertain and expensive. While one is stopping the flow of blood, supportive therapy, in the form of iron, vitamin B complex, and a high protein diet, should be carried out. Probably most important, the physician should assuage the patient's fears, for nothing is more frightening to a woman than the unimpeded, gushing flow that is not at the expected period.

Too often, hormones and other "shot treatments" are employed and an early malignant growth is overlooked. Razor-sharp judgment must be exercised. In case of doubt, a surgical specimen, obtained by curetting the endometrium or a biopsy from the cervix or vulva may save a patient's life. Relatively minor surgery, in the form of dilatation and curettage or multiple biopsies, should be performed early and routinely in doubtful cases. To depend on one's clinical judgment or experience in uncertain cases invites disaster, for only the trained pathologist can make the diagnosis from a surgical specimen. It is rarely necessary to resort to hysterectomy to control heavy vaginal bleeding. Radiation therapy to control uterine bleeding has been used only rarely. The long list of contraindications, the possible masking of early cancer, as outlined by Corscaden and associates[3] has resulted in the employment of other methods of control.

Each year, in the United States, approximately 15,000 woman die of cancer of the uterus unnecessarily. One-third of all women dying of cancer die of carcinoma of the uterus, and carcinoma of the cervix is responsible for 85% of the deaths of women dying of cancer of the uterus. The responsibility for this needless mortality lies primarily with the patients and secondarily with the medical profession. Numerous benevolent agencies are conducting campaigns to educate the lay public to the dangers of abnormal vaginal bleeding. We should encourage this education outline and aid it whenever possible. Secondly, we should train ourselves to suspect carcinoma in every patient. Attempts, by every means possible, should be made to detect it, and, once it is discovered, the patient should be assured of early, well-organized therapy by those trained in this field. Most gynecologists refer these patients to cancer treatment centers. Carcinoma of the cervix is primarily a disease of the late reproductive age group (35 to 55 years). Carcinoma of the fundus, rarely occurring before the age of 40, usually occurs between 50 and 60, the average age being about 57. Carcinoma of the vulva and ovary occurs later, but earlier lesions such as leukoplakia may be precursors of later vulvar cancer.

The mortality tables of carcinoma of the genitalia vary with two factors, the clinical stage and the histological type. The clinical stage is the more important factor, especially in carcinoma of the cervix, as is shown by Costolow and Nolan.[4] The mortality rate for cancer of the cervix may vary from 10% in stage 1 lesions (those confined to the cervix) to 100% (those with distant metastases). Every carcinoma of the uterus probably goes through an early preinvasion stage, during which complete cure is almost assured. In considering cancer of the cervix, the usual ratio of the stage at which it is seen by the examining physician is 15% at stage 1, 35% at stage 2, 35% at stage 3, and 15% at stage 4. Whereas the cure rate in stage 1 is 70 to 75%, it falls to almost 0 in stage 4. By recognizing even the earlier preclinical carcinomas in situ, we can further increase the cure rate and prevent some of the 15,000 needless deaths.

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[2] Hamblen, E. C.; Cuyler, W. K.; Pattee, C. J., and Axelson, G. J.: Endocrine Therapy of Functional Menometrorrhagia and Ovarian Sterility: Oral Use of Anhydro-Hydroxy-Progesterone and Estrogens, J. Clin. Endocrinol. **1**: 221, 1941.

[3] Corscaden, J. A.; Fretig, J. W., and Gusberg, S. B.: Carcinoma Subsequent to the Radiotherapeutic Menopause, Am. J. Obst. & Gynec. **51**: 1, 1946. Corscaden, J. A.: Gynecologic Cancer, New York, Thos. Nelson & Sons, 1951, p. 226.

Prevention of carcinoma of the uterus would be ideal if we could attain this goal. Because of the efforts of many conscientious workers, there are many ways in which carcinoma of the uterus can be kept from progressing to an incurable stage. Routine pelvic examination of all women, at least every six months, would aid tremendously. A careful speculum examination, with multiple biopsy, cervical coning, and smears, should be routine.

Multiparity is probably conducive to cancer of the cervix. An extensive study of Catholic nuns showed an almost complete absence of cancer of the cervix. At the delivery of a baby, routine inspection and careful repair of the cervix, as advocated by Tollefson,[5] would reduce the incidence of chronic, infected, cancer producing cervices.

Cashman [6] has shown the wisdom of conization and cauterization of the cervix in preventing cancer. Severely infected, lacerated cervices should be treated in this way at an early stage. If a subtotal hysterectomy rather than total hysterectomy must be performed, the surgeon may save a life by coning out the cervical stump with a Hyams type conization cutting cautery.

Early detection by the physician starts with the taking a good history. About 85% of all patients with cancer of the uterus bleed abnormally from the vagina. Any abnormal discharge or bleeding, especially contact bleeding in a multiparous patient of cancer age, should cause suspicion of a malignant growth in the cervix. An obese, hirsute, hypertensive, bleeding, nulliparous, diabetic woman, with a late menopause, should lead one to suspect cancer of the endometrium of the uterus, particularly if she has had earlier radiation to control excessive uterine bleeding. Postmenopausal endometrial polyps, as well as persistent endometrial hyperplasia are thought by many to predispose to later carcinomatous changes.

Cervical and endometrial biopsies are simple procedures. A multiple punch biopsy, one specimen from each quadrant at the squamocolumnar junction, is a five minute office procedure that any practicing physician can perform. Any cervix abnormal enough to require treatment should be subjected to biopsy. Suction curettage can be done in the office, but it is preferable for a thorough dilatation and curettage to be done in the hospital, in order to rule out carcinoma of the endometrium. Costolow and Nolan [4] have devised a cervical coning biopsy curet that removes a strip of tissue from the squamocolumnar junction of the cervix. Papanicolaou and Traut [7] have investigated the possibility of cytological diagnosis of early carcinomas. Considerable controversy has evolved about this latest discovery in cancer detection, but one must accept every diagnostic aid in early neoplastic discovery. The consensus seems to be that the method is a good screening process in the hands of trained vaginal cytologists.

In a review of 187 patients with cancer of the uterus who were admitted to the California Hospital over a period from 1946 through 1951, it was found that there was an average delay in seeking treating of 5.2 months by the patient and that this was followed by another period of 5.4 months procrastination by the physician. Thus, there was a total delay of 10.6 months. Patients with cancer of the cervix delayed longer than those with cancer of the corpus (5.6 months as compared to 4.7 months), whereas the physician delay was about the same for the two types of cases (5.2 and 5.7 months respectively). Questionable therapy was carried out in 36 (41%) of the endometrial cancer patients and in 18 (17%) of the cervical cancer group. Fortunately, there is a well-organized tumor group in close relationship to the California Hospital that ensures early, complete, and correct treatment to each patient under its care.

Subtotal hysterectomy was performed on many patients with cancer of the endometrium and a few patients with cancer of the cervix, in this series. Cervical amputations were done on patients with stage 3 carcinomas of the cervix. It is still correct to treat cancer of the endometrium by instilling radium into the uterus; this is followed, in four to six weeks, by total hysterectomy and bilateral salpingo-oophorectomy. Cancer of the cervix is still best treated by irradiation in experienced hands. New surgical techniques must stand the trial of time and general usage.

Howson and Montgomery [8] showed that the failure of the physician to examine the patient with genital cancer was responsible for over 50% of the delayed diagnosis. When the examination was made, the next most frequent cause of delay was a wrong diagnosis. Hypodermics and oral medication were prescribed for many patients. The performance of inadequate surgery before cancer had been ruled out by appropriate study is a cause of much needless mortality.

SUMMARY

An endeavor has been made to simplify the medical care of patients with abnormal vaginal bleeding. An early, complete, and correct diagnosis is essential. Every patient should be examined thoroughly under proper conditions. Multiple biopsy of any questionable cervical or vulvar lesion and curettage in patients with endometrial bleeding problems should be routine. Early referral to cancer treatment centers concludes the general practitioner's responsibility. Endocrine treatment can be instituted in patients with benign bleeding. Estrogens and male hormone are effective.

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[4] Costolow, W. E., and Nolan, J.: Factors Influencing Prognosis in Treatment of Carcinoma of Cervix Uteri, J. Obst. & Gynec. **61**: 548, 1951.

[5] Tollefson, D. G.: Immediate Attention to the Postpartum Cervix, West. J. Surg. **56**: 285, 1948.

[6] Cashman, B. Z.: Role of Deep Cauterization in Prevention of Cancer of the Cervix: Report of 10,000 Cases, Am. J. Obst. & Gynec. **41**: 216, 1941.

[7] Papanicolaou, G. N., and Traut, H. F.: Diagnosis of Uterine Cancer by the Vaginal Smear, New York, Commonwealth Fund, Division of Publications, 1943.

[8] Howson, J. Y., and Montgomery, T. L.: Attack or Delay Period in Diagnosis of Pelvic Cancer, with Further Observation of Philadelphia Study, Am. J. Obst. & Gynec. **57**: 1098, 1949.

The infant is inevitably endangered by the circumstances associated with the death of the mother. Table 6 shows that of the 191 infants delivered, both before the death of the mother or by postmortem extraction, 128 were liveborn and 63 were stillborn. Of the 128 liveborn infants, 21 died neonatally. It is significant to compare the percentages in the infants of women who died (67% liveborn, 33% stillborn, 16.4% died neonatally, and 56% surviving infants), with the figures for the total hospital births (98.5%, 1.5%, 1.9%, and 96.6%, respectively, in 1950).

TABLE 6.—*Data on Newborn of Mothers Who Died*

	Live Births	Fetal* Deaths	Total Births	Neonatal Deaths	No. Survived of Live Born	Percentage Survived of Total Births
1948	41	19	60	7	34	56.7
1949	52	20	72	6	46	63.9
1950	35	24	59	8	27	45.8
1948-1950	128	63	191	21	107	....
Percentages	67.0	33.0	..	16.4	83.6	56.0

* Fetuses advanced to 20th week of uterogestation.

Table 7, which shows an increase in the percentage of postmortem examinations from 29.1% in 1948 to 45.5% in 1950, gives evidence of greater interest and concern on the part of the medical profession in getting fuller information on maternal losses. Through an arrangement made early in 1951 between the Department of Public Health and the Illinois Society of Pathologists, it is hoped that there will be a still further effort for investigation of anatomic causes of maternal deaths.

Table 8 grades the quality of prenatal care according to the standards set up by the American Committee on Maternal Welfare. It is noted that in 40.9% this care was either poor or absent. It is, however, encouraging to note the trend for betterment in supplying adequate care, with an increase from 10.1% in 1948 to 25.8% in 1950, and the consequent decrease in poor care from 44.3% in 1948 to 16.7% in 1950.

Table 9 grades the quality of hospital records according to the standard approved by the American College of Surgeons. Records graded "excellent" have increased from 16.5% in 1948 to 34.8% in 1950; the percentage of records considered "poor" have dropped from 26.6% in 1948 to 13.7% in 1950. It should also be observed that, although prenatal care is a joint responsibility of physician and patient, the duty of adequate record-keeping must be assumed entirely by the physician.

TABLE 7.—*Maternal Autopsies*

	No. Performed	Percentage of Total	No. Not Performed	Percentage of Total
1948	23	29.1	56	70.9
1949	36	45.0	44	55.0
1950	30	45.5	36	54.5
1948-1950	89	39.6	136	60.4

SUMMARY

A summary is presented of a three year study, from 1948 through 1950, of 321 deaths associated with gestation in downstate Illinois. The 225 cases in which the death was classified as due to obstetric causes are discussed in detail. The study was effected through compilation of data on records and personal interviews of physicians by the consultant in maternity of the Bureau of Maternal and Child Health of the Illinois Department of Public Health. The audit of the case histories was made by the Maternal Welfare Committee of the Illinois State Medical Society.

Hemorrhage was the cause of death in 35.5%, toxemia in 25.7%, and infection in 13.1%. In the remaining 25.7% of deaths attributed to various conditions, embolism was the cause in 13.5%, and anesthesia in 5.1%. Nearly one-half of all mothers died within 24 hours after admission to the hospital; more than one-half of all mothers died within 24 hours after delivery; three out of every five maternal deaths were due to hemorrhage and/or toxemia. Natural births occurred in 30.8%; cesarean section was done in 43.2%; and other operative procedures were resorted to in 26%.

Evidence of improvement in downstate Illinois was noted by the following figures for 1948 and the comparable data for 1950. 1. The maternal mortality rate per 1,000 live births decreased from 0.87 to 0.61. 2. The percentage of cases in which autopsy was performed increased from 29.1 to 45.5. 3. The incidence of errors in certifying causes of death decreased from 23.6% to 6.2%. 4. The percentage of births in hospitals increased from 92.9% to 95.7%. 5. The percentage of cases with adequate prenatal care increased from 10.1% to 25.8%. 6. The proportion of records considered excellent increased from 16.5% to 34.8%.

TABLE 8.—*Quality of Prenatal Care*

	1948		1949		1950		Total	
	No.	%	No.	%	No.	%	No.	%
Adequate	8	10.1	18	22.5	17	25.8	43	19.1
Fair	19	24.1	23	28.8	15	22.7	57	25.3
Poor	35	44.3	20	25.0	11	16.7	66	29.3
None	9	11.4	10	12.5	7	10.6	26	11.6
Unknown	8	10.1	9	11.2	16	24.2	33	14.7
Total	79	100.0	80	100.0	66	100.0	225	100.0

TABLE 9.—*Quality of Records*

	1948		1949		1950		Total	
	No.	%	No.	%	No.	%	No.	%
Excellent	13	16.5	20	25.0	23	34.8	56	24.9
Good	17	21.5	16	20.0	20	30.3	53	23.5
Fair	28	35.4	25	31.3	12	18.2	65	28.9
Poor	21	26.6	17	21.2	9	13.7	47	20.9
None	..	....	2	2.5	2	3.0	4	1.8
Total	79	100.0	80	100.0	66	100.0	225	100.0

The study demonstrated its value in acquisition of knowledge and attainment of higher standards in obstetric practice. It pointed to the desirability of maintaining and bettering advances already achieved. It directed attention to the need for better education of the medical student, the practitioner, and the laity in obstetric problems. It emphasized the urgency for early diagnosis of complications, for adequate consultation, for immediate availability of proper facilities in treatment, for judicious intranatal management, for avoidance of unwarranted operative intervention, and for correct postnatal follow-up. If these needs are met, there will result a still greater saving of lives of mothers.

EPIDEMIC OF TUBERCULOSIS IN A HIGH SCHOOL

REPORT OF EIGHT YEAR FOLLOW-UP OF STUDENTS EXPOSED

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An unusual incidence of progressive pulmonary tuberculosis occurred in a rural New York high school in which during a two year period 13 of 133 pupils and one of their teachers were found to have the disease. Tuberculosis developed in two additional students in this group and one from the next lower class within the subsequent eight years.

Explosive outbreaks of pulmonary tuberculosis among pupils of high school age are rare, although sporadic cases secondary to an active case in a school population are not uncommon. In 1949 Roe and Dick [1] reported the investigation of a school group in which a master and 12 of 342 boys 13 to 17 years of age were discovered to have tuberculosis. They cited reports in the literature of school epidemics of tuberculosis among children under the age of 13, but could find only one report, that of Hyge,[2] concerned with students of high school age. In that epidemic, in which the source was traced to a teacher, 45 cases of pulmonary tuberculosis occurred among 305 school girls 12 to 18 years of age.

This study deals with a central rural school situated in open country amid scattered farms remote from any city or village. The school serves a community having a rural white population estimated at 2,731. The tuberculosis morbidity and mortality in this area are not significantly different from those in other rural sections of New York. The school population ordinarily includes about 300 pupils in the first eight grades and about 100 in the high school, with some 26 teachers and 10 other employees. Most of the pupils are transported by school buses and have their noon meal in the school cafeteria. The building is modern, adequately equipped, well lighted and ventilated, and kept in good condition. There are no obvious faults in general sanitation or unusual features that might account for the spread of tuberculosis.

Although the school group had not been examined, there were no known cases of tuberculosis in the school until July, 1942, when the diagnosis was made in the initial case (case 1) in this series one month after the patient had graduated. During the next 14 months four of his former schoolmates who had left school at the same time were found to have pulmonary tuberculosis (cases 2 to 5). The discovery of these five cases within a little more than a year after the patients had left school, with no known familial exposure to the disease, suggested the possibility of a common source of infection and the need for examination of their associates at school to discover, if possible, the source case and others who might have been infected.

CHEST X-RAY SURVEYS

The school faculty and employees, and the students of the seventh and eighth grades and high school were examined by roentgenograms in December, 1943. One of the teachers and four of the students in the high school were thus found to have pulmonary tuberculosis (cases 6 to 10) and were promptly excluded from school. Reexamination of the high school students in April, 1944, revealed two additional cases (cases 11 and 12, chart 1) in pupils who had no abnormality at the previous examination. The pupils of the first eight grades who had positive tuberculin reactions were examined at this time, and no cases were found among them.

A community-wide chest x-ray survey was conducted in the area served by the school in May, 1944. No cases of tuberculosis were found among the 878 persons examined. All faculty members with the exception of one grade school teacher and all employees who had left the school between September, 1941, and the time of the first survey in December, 1943, were examined by x-ray studies, and no cases of tuberculosis were found among them.

FOLLOW-UP

No additional cases were found among the pupils who continued in high school and the tuberculin reactors in the first eight grades at reexaminations in November, 1945, May, 1946, and finally in March, 1948. The study of the pupils who remained in school was concluded with the last-mentioned examination, since all of those who had been in school during the school year 1943-44 when the last cases were discovered would either have graduated or left school by that time. The pupils who graduated or left high school between September, 1941, and June, 1945, were consistently followed after they left school. Of these 122 (133 less 11 cases) former students, 108 were examined one or more times after leaving school. Among them five additional cases (cases 13, 14, 15, 16, and 17) were found. Fourteen former high school students were lost to further observation after leaving school.

TUBERCULIN SURVEYS

After the preliminary screening chest x-ray survey examination in December, 1943, a time interval was allowed for the possible development of allergy resulting from exposure to the last-discovered cases. To determine the incidence and prevalence of infection and to provide information for use in follow-up, the pupils of the lower

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This article has been abbreviated by the omission of charts 1 and 2 and tables 1, 2 and 3. *These will appear in the authors' reprints.*

Read before the Section on Diseases of the Chest at the One-Hundredth Annual Session of the American Medical Association, Atlantic City, June 13, 1951.

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[1] Roe, J. T. N., and Dick, W. P.: Tuberculosis Survey of Suspected School Group, Tubercle 30: 39 (Feb.) 1949.

[2] Hyge, T. V.: Epidemic of Tuberculosis in State School, with Observation Period of About 3 Years, Acta tuberc. Scandinav. 21: 1, 1947.

grades as well as those in the high school were tested with 0.0002 mg. of purified protein derivative of tuberculin intracutaneously in April, 1944, May, 1946, and March, 1948. The results of these surveys are compared in table 1 with those carried out in nearby schools during the period 1939-1944. In 1944 there was a higher percentage of reactors in all grade levels, and particularly in grades 9 to 12, in the study school as compared with the composite of nearby schools (chart 2).

The average percentage of tuberculin reactors in the school dropped from 26.5 to 8.9% during the four year period from 1944 to 1948. This latter figure approximates the mean percentage of 6.4, which was the proportion of reactors among 30,642 students of schools in New York State examined[3] in 1946-47. This return in 1948 to the average percentage of tuberculin reactors expected in such a school population is a reflection of the control measures taken in the school.

CLINICAL CHARACTERISTICS

All patients were hospitalized, and while they were being treated by bed rest, the disease was found by clinical[4] and laboratory study and serial roentgenologic observations to be active in all. Tubercle bacilli were recovered from the sputum or gastric contents in all except one (case 2), who had tubercle bacilli in the spinal fluid. At the time of discovery the disease was far advanced in 1, moderately advanced in 5, and minimal in 11. It was unilateral in 11 and bilateral in 6. The lesions in two (cases 6 and 16) were considered as being predominantly fibrotic. In the remaining 15 they were regarded as being predominantly exudative, and in 6 they were of the type usually described as the early infiltrate.

During the early months of treatment the disease, as noted by serial chest x-ray films, was unstable or progressive in 15, stationary in 1 (case 16), and retrogressive in 1 (case 12). Collapse therapy was required in eight. Three patients died, 2 are still hospitalized, and the disease in the remaining 12 is inactive, with sputum or gastric contents culturally negative for tubercle bacilli.

EPIDEMIOLOGY

All of the cases among pupils occurred in the high school classes. The first-discovered case was among those who graduated or left school in June, 1942, and the last case in those at school was found in April, 1944. Thus the student population who may have been exposed to the infection at school consisted of those who were registered in the school during the three school years 1941-42, 1942-43, and 1943-44. Of the total high school registration of 203 during this period, 119 were girls, among whom 14 cases occurred, and 84 were boys, among whom only 2 cases were found.

Considering the initial case as the primary case, the number of pupils concerned was 133, the total high school registration for the single school year 1941-42. All of the discovered cases among the pupils except one (case 15) were in this group. When it is considered that the disease was diagnosed in 13 of them within the succeeding two years, an attack rate of 9.8% for that period, and also that it was diagnosed in the teacher who was associated with them, the explosiveness of the outbreak is emphasized.

All of the pupils were native-born white persons from farm or small village homes. Their level of nutrition and living conditions were reasonably good. There was no unusual environmental strain, such as physical excesses, emotional experiences, or dietary irregularities. There had been no epidemics of acute respiratory illnesses in the school other than the expected incidence of common colds.

With only two exceptions, the father of one (case 5) and stepmother of another (case 9), all of the family members and household associates of each patient were examined. The 18-year-old sister of the patient in case 1, who attended another school and is not included in this series of cases, was found to have tuberculosis, which was regarded as secondary to that of her brother. Case 3 was discovered through examination of family members of the patient in case 2 and may possibly have been a secondary case, although both students attended the school at the same time. There was no other family history of exposure to tuberculosis in any of the cases. There was no significant extraschool contact in any of the discovered cases, except in the initial case. In this case the source of infection was traced to a sporting goods dealer who was a Boy Scout master. This man died of tuberculosis soon after the diagnosis was made in the initial case in this series.

School buses were considered as a possible mechanism for spread of the disease, and while all but two of the patients reached school by bus, only three of those who had tuberculosis rode together, two used another bus, two rode together in a third bus, and the remaining patients reached school by separate buses.

Most of the pupils who were found to have tuberculosis had their meals at the school cafeteria and consumed the pasteurized milk served there. Laboratory study of the tubercle bacilli in all of the cases indicated that they were human and not bovine strains of tubercle bacilli.

All of the pupils in whom tuberculosis developed, with the exception of the patient in case 15, were in school during the last half of 1942. She was in the eighth grade then, and entered the high school the following autumn. Activities of the high school students were usually separate from those of the lower grades, except for general assemblies, athletic events, and school parties. The two groups of students had their meals at different hours and used separate classrooms. The patient in case 15, however, may have had some contact with a patient who was in the high school during the latter half of 1942. Careful questioning and the study of classroom and extramural activities in each case revealed only one situation common to the whole group. All the pupils in whom tuberculosis developed were taught by the teacher (case 6) at some time; eight were also in her homeroom for periods ranging from one-half to two years. Various classrooms in the school were used by her, and they were also used by other teachers. This teacher taught two classes in which no cases of tuberculosis developed.

In a small school such as this, many of the patients had association with each other in various classes and homerooms, and there was, of necessity, a certain amount of association in the corridors when changing classrooms, and in the homerooms, auditorium, cafeteria, cloakrooms, and washrooms. Some of the associations of the patients with each other in school are not unlike those among schoolmates reported by Downes.[5]

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[3] Tuberculosis Control Efforts 1946-1947, *Annual Report*, New York State Education Department, 1947.

[4] Terminology According to Diagnostic Standards and Classification of Tuberculosis, New York, National Tuberculosis Association, 1950.

A factor that seemed to be common to a majority of the cases and that may possibly have had some significance was that, of the 16 students who had tuberculosis, 8 sang in the school chorus in 1941-42 and 5 (4 of the 8 and 1 additional) in 1942-43 (cases 3, 4, 7, 8, 9, 10, 12, 14, and 17). In the first year this group consisted of 37 girls and 15 boys, while in the second year it contained 34 girls and 14 boys. The chorus routinely met twice a week, rehearsing in the gymnasium and various classrooms for periods up to one hour. No information of significance was obtained concerning the usual seating arrangement or other details about the intimacy of contact during these rehearsals. One of the girls played the piano, four were in the soprano section, and one sang alto. Two girls (cases 8 and 10) sang in a quartet, together with two persons in whom tuberculosis did not develop. The tuberculin sensitivity of pupils who sang in the chorus in these two years fails to indicate that the chorus members had a significantly different ratio of tuberculin sensitivity from their classmates who did not sing in the chorus. The participation of these 16 students in the school chorus has some resemblance to the occurrence of four cases of tuberculosis attributed to exposure to an active case in a church choir, reported by Twinam and Pope.[6]

No other comparable concentration of cases in a single activity was encountered, except that the gymnasium classes were attended by all students. However, sex and age classifications divided participation in the gymnasium into groups, none of which showed a concentration of cases.

In 1941-42 five of the patients played in the orchestra, composed of 26 members, and 6, including 4 of the above-mentioned, played in the band composed of 52 members in the same year. The possibility that the school band might have served as a source of spread of tuberculosis through the exchange of wind instruments with contaminated mouth pieces was considered, but study of this possibility tended to exclude it as a factor. A number of other associations of the patients with each other, but to a lesser degree, were observed, none of them strikingly significant.

COMMENT

The foregoing observations would seem to give an adequate explanation of how tuberculosis may have spread from one or more infectious cases in the school. The circumstances in themselves, however, were not unusual and are probably duplicated in most other schools. The initial case occurred in a boy who was not especially friendly with those in the other cases. He had cough and expectoration beginning in March, 1942, and remained in school until graduation on June 23, 1942. On June 20 he had a temperature of 103 F. On July 9, when examined by x-rays for the first time, he had moderately advanced bilateral pulmonary tuberculosis, with cavity and sputum positive for tubercle bacilli. During his last four months in school he undoubtedly was infectious, because by July he had infected his sister, and it seems likely that he was the source case in the school.

The possibility that the teacher was the source case or one of the source cases was considered. She entered the school in January, 1942, and taught all of the patients. Unfortunately she had not had a tuberculin test or chest x-ray examination prior to the school chest x-ray survey in December, 1943, when her disease was discovered. It is possible that it may have been present for some time, and it is conceivable that at some time in the past it may have been active and in a communicable stage. She had been well, however, and had had no cough, expectoration, or other symptoms suggesting tuberculosis until October, 1943, when she noted undue fatigue with anorexia and weight loss. A gastric contents culture on Dec. 6, 1943, grew two colonies of tubercle bacilli, and that of Jan. 7, 1944, grew three colonies, the former confirmed by animal inoculation. All sputum cultures were negative, and many gastric contents specimens cultured during subsequent months were negative for tubercle bacilli. The epidemiological significance of patients with pulmonary tuberculosis who have no roentgenologic evidence of cavity, who have no cough, and in whom tubercle bacilli can be demonstrated only by culture of gastric contents in low numbers of colonies is questionable. She was only a few years older than the students and rather than being the source case or one of the sources, her case may well have been secondary. Regardless of the identity of the original source case in school, there were during the period of observation other cases capable of spreading the infection before they were diagnosed, so that the sources of infection were multiplied.

In considering the factors responsible for the unusual prevalence of tuberculosis in this school group, the question naturally arises as to whether these students lacked inherent native resistance or acquired resistance to tuberculosis. The age of adolescence and the female sex were undoubtedly significant.[7] There is no information available regarding the prevalence of tuberculous infection in the community, such as would be indicated by previous tuberculin test surveys. In view of the rural character of the community with its low mortality rate and scarcity of residents with tuberculosis, many of the inhabitants may never had come in close contact with tuberculosis. Judging from tuberculin records of high schools in surrounding areas and in the study school about four years after the epidemic (table 1), it is possible that at the time the first case was introduced into its midst most of the student population of the school had probably not been exposed previously to tuberculosis and the students in whom tuberculosis developed became ill following their primary infection largely because they had had no prior opportunity to develop specific relative immunity. This presumable lack of resistance, more than the factors of exposure and mechanics of transmission, may have been responsible for the explosive and extensive nature of the outbreak.

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[5] Downes, J.: How Tuberculosis Spreads in Rural Community, Am. J. Pub. Health 26: 30 (Jan.) 1936.

[6] Twinam, C. W., and Pope, A. S.: Pulmonary Tuberculosis Resulting from Extra-Familial Contacts, Am. J. Pub. Health 32: 1215 (Nov.) 1942.

[7] Heaf, F. R. G.: Infection and Disease, with Special Reference to Tuberculosis, Brit. J. Tuberc. 45: 41 (April) 1951.

Without prior tuberculin tests it was impossible to determine in the discovered cases whether the lesions were due to progressive primary tuberculosis or to reinfection. From the data at hand, however, it seems likely that most of them were primary infections. Pulmonary infiltrates that develop in adolescents and adults have much the same clinical and roentgenologic characteristics, whether due to primary infection or reinfection, and it is impossible by such methods of examination to distinguish one from the other.[8] Lymph node swelling was not demonstrable clinically or roentgenologically in any of the cases, and calcification of parenchymal or lymph node foci was observed roentgenologically in only one instance (case 10). At necropsy the disease was regarded as primary in two of the three patients who died (cases 2 and 15). It was impossible to establish with certainty whether the disease was primary or a reinfection in the other (case 1).

The liability to clinical and more active disease during the few months or years following the first infection in adolescence is recognized. The exposure of a susceptible group to one or more infectious cases may have accounted for the fact that there were many cases of clinical disease rather than subclinical infections. The seriousness of pulmonary tuberculosis in adolescents and young adults has been emphasized by Myers[9] and others.[10] Amberson[11] has stressed the instability of such lesions and, especially in females, their strong tendency to progress.

SUMMARY

An epidemic of progressive pulmonary tuberculosis in a high school is reported. Among 133 pupils enrolled during a single school year, 13 cases were discovered within the succeeding two year period. A 23-year-old teacher associated with them was also found to have the disease. During the subsequent eight year period, tuberculosis developed in two additional students in this group and one from the next lower class who entered the high school the following year. The ages of the pupils at the time of diagnosis ranged from 16 to 21 years. Diagnoses were made through chest x-ray surveys and confirmed by the isolation of tubercle bacilli from the sputum or gastric contents in all except one patient, in whom tubercle bacilli were demonstrated in the spinal fluid. All had active progressive pulmonary tuberculosis and were hospitalized. There were three deaths. Two patients are still hospitalized. The remaining 12 have recovered clinically, have inactive disease with sputum or gastric contents culturally negative for tubercle bacilli, and are well and working.

There was no significant familial exposure to tuberculosis except possibly in one case. The probable source case was the initial case, whose infection it was possible to trace to an extrafamilial source outside the school. An extraschool source could not be found in any of the other cases. The explosiveness and extent of the outbreak were attributed to repeated exposure of a susceptible group.

Homer Folks Tuberculosis Hospital (Dr. Horton).

[8] Diagnostic Standards and Classification of Tuberculosis, New York, National Tuberculosis Association, 1950.

[9] Myers, J. A., and Kernkamp, L. M.: Tuberculosis Among Girls and Boys in Their Teens, Am. Rev. Tuberc. **21**: 509 (April) 1930.

[10] Morgan, R.: Certain Aspects of Pulmonary Tuberculosis in Children, with Special Reference to Prognosis, Am. Rev. Tuberc. **29**: 577 (May) 1934. Zacks, D.: Pulmonary Tuberculosis in Second Decade of Life: Its Treatment and Prognosis, ibid. **39**: 703 (June) 1939. Horton, R.: Tuberculosis in Adolescents and Young Adults, New York State J. Med. **42**: 2131 (Nov. 15) 1942.

[11] Amberson, J. B., Jr.: *Significance of Latent Forms of Tuberculosis,* New England J. Med. **219**: 572 (Oct. 13) 1938.

APPRAISAL OF PROTECTIVE VALUE OF BCG VACCINE

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The logical approach to the development and evaluation of a specific immunizing agent against tuberculosis requires not only an understanding of the fundamentals of immunity but an appreciation of the many factors that make such an evaluation difficult. These factors include variations in the biology of the tubercle bacillus, the susceptibility of the host, the pathogenesis of the disease, the degree of exposure, social and economic factors, and an almost universal decline in the morbidity and mortality from tuberculosis. The diversity of opinion as to the part played by these different factors in the epidemiology and pathogenesis of the disease and the existence of two widely separate schools of thought on the role of allergy are proof of the intricacy of the problem.

It is our view that the evidence for the development of acquired resistance following primary infection with tubercle bacilli is sound. Increased resistance to reinfection can be demonstrated in susceptible animals treated with minute numbers of viable, virulent tubercle bacilli administered as a single dose, or in repeated doses at appropriately spaced intervals. Similar results have been obtained following the use of large numbers of viable avirulent cultures of tubercle bacilli, such as the R_1 human type of Saranac Lake, the BCG bovine type of the Pasteur Institute, or closely related viable mycobacteria, such as the murine type or vole bacillus.

The immunity in tuberculosis is not as complete as the immunity following such a bacterial disease as typhoid or the immunity following certain virus infections. Furthermore the immunity in tuberculosis tends to decrease with the disappearance of viable tubercle bacilli. The observations of Marfan[1] in 1886 that pulmonary tuberculosis occurred infrequently in those who

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[1] Marfan, A.: De l'immunité conférée par la guérison d'une tuberculose locale pour la phthisie pulmonaire, Arch. gén de méd. **17**: 423, 1886.

had evidence of healed cervical adenitis has been confirmed by many observers. Of special interest are the observations of Treon,[2] who in 1888 described his medical experience among the Sioux Indians of Dakota. He reported, "I have noticed that patients who have large glands and scrofulous sores do not as a rule have phthisis pulmonalis." More recently Bordley and Baylor[3] observed 79 persons who had had tuberculosis of the cervical lymph nodes or tonsils 11 to 23 years previously. In no instance could they demonstrate evidence of pulmonary tuberculosis.

At the present time the almost general acceptance that some degree of increased resistance follows a primary infection is predicated on the infrequency with which a second primary complex is found, on the containment and disappearance of viable tubercle bacilli in arrested lesions,[4] on the localization and chronicity of the lesions of reinfection, and on the infrequency of bacillaemia and hematogenous spread of the disease to other organs.

The mechanism of immunity in tuberculosis has been carefully investigated by Willis.[5] This investigator found that migration of virulent tubercle bacilli from the site of injection was greatly retarded in guinea pigs previously treated with viable, avirulent tubercle bacilli and that only a small number of the organisms of reinfection reached the remote parts of the body. Freund and Angevine[6] found that tubercle bacilli introduced into the skin of rabbits immunized by heat-killed tubercle bacilli were fixed at the site of injection, and their spread to other parts of the body was retarded.

The impracticability of using viable virulent tubercle bacilli in man to induce resistance and the inconclusive results following the use of nonviable tubercle bacilli has led to widespread investigations of the value of viable, attenuated cultures of tubercle bacilli as immunizing agents. One of the most widely used of such cultures has been the BCG culture of Calmette and Guerin.

The BCG culture originated from a virulent, bovine type tubercle bacillus isolated in 1902 from the tuberculous udder of a cow. This culture was originally known as "souche lait Nocard." According to Calmette and Guerin,[7] this culture was attenuated as a result of transplanting the original culture for 230 generations over a period of 13 years on potatoes impregnated with beef bile and glycerine. This attenuated strain has retained the cultural, tinctorial, antigenic, and tuberculogenic properties of the original culture, as well as the ability to produce potent tuberculin. It differs, however, from the original culture in that it does not produce progressive tuberculosis in animals as susceptible as the guinea pig.

BCG vaccine was first used in France in 1921. Since then it has been estimated that approximately 50 million persons of various ages living in different parts of the world, some under the most adverse and primitive conditions, have received the vaccine. It can be stated unequivocally that up to the present time there has been no evidence that the BCG culture has produced progressive tuberculosis in animals or man. Despite the extensive use of BCG vaccine there is a diversity of opinion regarding its value. This in great part has been due to lack of adequately controlled investigations and to the difficulty of dissociating the specific protective role of BCG vaccine from an almost universal spontaneous decrease in the morbidity and mortality from tuberculosis, antedating the use of BCG vaccine.

In order to appraise as objectively as possible the specific value of BCG vaccine in control of tuberculosis, a joint investigation was undertaken by the Henry Phipps Institute, University of Pennsylvania, and the Branch of Health, Bureau of Indian Affairs, Department of the Interior. This study was initiated in December, 1935, and it was not until February, 1938, that all of the injections of BCG vaccine and saline solution were completed in the different areas.

The selection of the Indian population for this study was based on the interest of the Bureau of Indian Affairs in using all possible control measures to reduce the mortality and morbidity from tuberculosis among these people. Furthermore, the ease of following these Indians over a long period of time, the relatively uniform low economic and housing conditions, coupled with the high morbidity and mortality from tuberculosis, made this an ideal group for determining the effectiveness of BCG vaccine.

This investigation was conducted in five different geographical areas and included eight different tribes. These are the Pima Agency, Arizona, inhabited by the Pima tribe; the Wind River Agency, Wyoming, inhabited by the Shoshone and the Arapaho tribes; the Turtle Mountain Agency, North Dakota, inhabited by Chippewas; the Rosebud Agency, South Dakota, inhabited by Sioux Indians; and 12 communities of southeastern Alaska peopled by members of the Thlingit, Tsimpsian, and Haida tribes. These agencies and communities are widely scattered, and the inhabitants live under greatly differing climatic conditions. They vary in their dietary habits and represent different social and cultural patterns. In general, their economic condition is low, housing poor, and homes overcrowded.

To obtain the full cooperation of the Indian population meetings were held with the tribal councils and with the general population in different parts of the reservations. The purpose of the tuberculin test and x-ray examination and the procedure of immunization were explained. As a result of these meetings, excellent cooperation was obtained at the inception of the study, and this interest has continued.

PLAN OF STUDY

The importance of collecting basic data dealing with the occurrence of tuberculosis among the Indian population was realized. Following a reconnaissance of the various agencies and of southeastern Alaska, it was apparent that no precise information was available on the incidence of tuberculosis, and in most instances no objective data to support a diagnosis of tuberculosis. This was due, in 1935-1936, in great part to lack of x-ray and laboratory equipment. Since then the Office of Indian Affairs has equipped all hospitals with x-ray units and adequate clinical laboratory facilities.

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[2] Treon, F.: Medical Work among the Sioux Indians, J. A. M. A. **10**: 224 (Feb. 25) 1888.

[3] Bordley, J., III, and Baylor, J. W.: Prognosis in Cases of Tuberculosis of the Tonsils, Adenoids and Cervical Lymph Nodes: Study of Patients Followed for 11 to 23 Years, Bull. Johns Hopkins Hosp. **63**: 132, 1938.

[4] Opie, E. L., and Aronson, J. D.: Tubercle Bacilli in Latent Tuberculous Lesions and in Lung Tissue Without Tuberculous Lesions, Arch. Path. **4**: 1, 1927. Feldman, W. H., and Baggenstoss, A. H.: The Residual Infectivity of the Primary Complex of Tuberculosis, Am. J. Path. **14**: 473, 1938.

[5] Willis, H. S.: Studies on Tuberculous Infection: XI. The Early Dissemination of Tubercle Bacilli after Intracutaneous Inoculation of Immune Guinea Pigs of Reinfection, Am. Rev. Tuberc. **11**: 439, 1925.

[6] Freund, J., and Angevine, D. M.: The Spread of Tubercle Bacilli in the Bodies of Sensitized and Immunized Animals, J. Immunol. **35**: 271, 1938.

[7] Calmette, A., and Guerin, C.: Sur quelques propriétés du bacille tuberculeux cultivé sur la bile, Compt. rend. Acad. d. sc. **147**: 1456, 1908.

The initial phase of this study consisted of determining the mortality and morbidity from tuberculosis and the incidence of tuberculous infection in the general population. These data were to be an index of the extent of tuberculosis and the basis for calculating the possible risk of exposure to this disease in the group to be studied subsequently. The mortality from all causes and from tuberculosis was compiled from the available death certificates on each agency. The rates for total deaths are approximations only, because of delays in filing death certificates and failure in registering deaths. Similarly the mortality rates from tuberculosis are far from accurate because of unsubstantiated diagnoses, the tendency to diagnose tuberculosis too frequently, and the many death certificates giving the cause of death as "unknown." This latter circumstance can be attributed to absence of medical care in some areas or to inaccessibility of hospitals, and at times to lack of interest by certain medical personnel. Thus, in one area the percentage of certificates listing "cause of death unknown" fell from 20 and 23% in two successive years to 0.5% when the medical officer was replaced.

TABLE 1.—*Distribution by Sex and Five Year Age Periods of BCG Vaccinated Persons and Controls*

Age in 5 Year Periods *	Number Vaccinated			Number of Controls		
	Males	Females	Total	Males	Females	Total
Under 5	204	229	433	213	200	413
5- 9	306	353	659	322	302	624
10-14	191	196	387	170	181	351
15-19	36	36	72	33	36	69
Total	737	814	1,551	738	719	1,457

* Age at beginning of study.

Because of the general impression that tuberculosis is widespread among Indians, there is a tendency to make this diagnosis without confirming evidence. Sudden and marked changes in the mortality rate from tuberculosis have been associated also with change of medical personnel. This was exemplified in the tuberculosis mortality rate for the Turtle Mountain Agency when the death rate from this disease dropped from 373 per 100,000 in 1941 to 27 in 1942 and to zero in 1944.

While annual population figures for the natives of southeastern Alaska are not available, the statistical data assembled in 1936 indicated a population of 4,190 natives in the 12 communities of southeastern Alaska included in this study. Unfortunately the number of deaths from tuberculosis for these communities is not available; however, the death rate from tuberculosis for the natives of the Territory of Alaska ranged between 709 and 1,049 per 100,000 during the decade of 1930-1940, inclusive.

The incidence of tuberculous infection was determined by means of the tuberculin test. This was carried out by members of the Tuberculosis Control Unit, which was organized by the Bureau of Indian Affairs to study the protective value of BCG vaccine. The tuberculin test was conducted on a total of 8,420 persons, ranging in age from less than 1 year to 60 years and over. This group represented a cross-section of the population, including all children attending the government and denominational schools.

An initial intracutaneous injection of 0.00002 mg. of purified protein derivative of tuberculin was made in the forearm. Readings were made 48 hours after the injection and, if they were negative, these persons were reinjected with 0.005 mg. of purified protein derivative and second readings made 48 hours later. The same preparation of purified protein derivative of tuberculin (trichloracetic acid preparation), supplied by Dr. Florence Seibert of the Henry Phipps Institute, was used for the first five years of the study; after that time another sample (an ammonium sulphate preparation), also supplied by Dr. Seibert, was used. The required dilutions of purified protein derivative were prepared daily from the concentrated solution, and were not used when more than 24 hours old. The injections and interpretations of the tuberculin reaction were made with but few exceptions by the same persons throughout the study. The incidence of tuberculous infection as determined by the tuberculin test varied little on the different agencies. The mortality rate from tuberculosis on the Indian reservations studied ranged from 200 to 300 per 100,000, while the mortality rate in Alaska ranged from 500 to 600 per 100,000.

Hypersensitivity to tuberculin is marked among American Indians. Among those who reacted to tuberculin, 91.1% had positive reactions to the initial dose of 0.00002 mg. of purified protein derivative and approximately 5% of those who reacted had a 4+ reaction characterized by vesiculation and necrosis. The percentage of those who react to tuberculin increases rapidly in increasing five year age groups.

The morbidity from tuberculosis among the general population was determined by roentgenologic examination of the chest of an unselected sample of the population. The proportions examined by x-rays ranged from 30.6% of the population on the Rosebud Agency to 77.6% of the Indian population of southeastern Alaska. Pulmonary lesions compatible with a diagnosis of tuberculosis ranged from 1.1% of those examined roentgenologically on the Pima Agency, Arizona, to 6.9% among those living in southeastern Alaska. The data collected from agency records indicated that tuberculosis was the most frequent cause of death, and the data compiled by the Tuberculosis Control Unit, following the tuberculin testing and x-ray examinations, indicated a high incidence of tuberculous infection and disease.

With completion of the phase of the work dealing with the mortality and morbidity from tuberculosis and with the incidence of tuberculous infection in the areas selected for the study, the group to be included in the evaluation of BCG vaccine was next selected. The criterion for inclusion in this group was failure to react to both 0.00002 mg. and 0.005 mg. of purified protein derivative of tuberculin. Separate cards were prepared for all persons in the preschool and school population who did not react to either dose. Each card gave the name, sex, birth date, school or school district, date, and result of the initial tuberculin test. The cards for each school were then sorted according to sex and year of birth. By alternation each age group of both males and females was divided into two approximately equal groups. Of these two groups, one received an intracutaneous injection of either 0.1 or 0.15 mg. of freshly prepared BCG vaccine in the skin over the region of the deltoid muscle, while the other group received an injection of 0.1 ml. of isotonic sodium chloride solution and served as controls. In a small number of instances a person designated to receive the BCG vaccine was absent from school, and a person from the group originally listed as a control was substituted. The comparability of both groups according to age and sex at the initiation of the study is indicated in table 1.

The name and location of the agencies, name of tribe, number vaccinated, number of controls, year when study was initiated, and the number of years and persons observed are summarized in table 2. At the time of vaccination the local Indian Service Public Health nurses prepared a personal and household record for each of the vaccinated and control persons. The personal record supplied pertinent data applying to the medical history of each person, while the household record consisted of a description of the household with the number and ages of all members therein, details of living conditions, and medical histories. These records were kept current between the annual visits of the Tuberculosis Control Unit by the addition of all medical data relating to the individual and to the household, with especial reference to exposure to tuberculosis.

TABLE 2.—*Year Study Was Initiated, Length of Observation, and Number of BCG Vaccinated Persons and Controls, by Agency and Tribe*

Agency	Tribe	Month and Year Initiated	Month and Year Last Observed	No. of Years Observed	Vaccinated		Person Years Observed	Controls		Person Years Observed
					No.	No. Traced		No.	No. Traced	
Pima, Ariz.	Pima	Feb., 1936	March, 1951	15	258	258	3,764	263	261	3,760
Wind River, Wyo.	Shoshone	July, 1936	June, 1951	15	110	110	1,602	85	85	1,223
Wind River, Wyo.	Arapaho	June, 1936	June, 1951	15	118	118	1,707	106	106	1,435
Turtle Mt., N. D.	Chippewa	Oct., 1936	June, 1951	15	170	170	2,498	162	161	2,358.5
Pima, Ariz.	Pima	Feb., 1937	March, 1951	14	96	96	1,325	86	86	1,166
Rosebud, S. D.	Sioux	Oct., 1937	June, 1951	14	301	294	4,059.5	291	284	3,898.5
Alaska, Southeastern	Tlingit, Haida, Tsimshian	Jan., 1938	June, 1951	13	498	488	6,290	464	461	5,679.5
Total					1,551	1,534	21,245.5	1,457	1,444	19,520.5

PREPARATION OF BCG VACCINE

The 13 different lots of BCG vaccine used in this study were prepared in a mobile laboratory, which was set up usually in a school house and away from all contact with infectious material. The BCG vaccine was used, without exception, within three days after its preparation. The preparation of and local reaction to the vaccine have been reported previously.[8]

Since the interval between the initial tuberculin test and the injection of the vaccine or sodium chloride solution averaged six weeks, a practice no longer followed, it was necessary to consider the possibility that some persons may have been in a preallergic state at the time the tuberculin reaction was negative and that some may have had a tuberculous infection after the testing. To determine this, the site of BCG vaccination was examined 48 hours after vaccination to note whether or not a local, exaggerated inflammatory reaction (Koch phenomenon) had occurred. Such a reaction indicates tuberculous infection preceding vaccination. A total of seven persons showed such a reaction. In five cases this occurred in persons who had been tuberculin positive and who, by error, received the vaccine. In two instances persons who were originally tuberculin negative showed a well-marked Koch phenomenon 48 hours following vaccination. One of these persons died approximately three months later from tuberculous meningitis, confirmed by autopsy, and the other died from pulmonary tuberculosis and tuberculous meningitis nine years later. Despite these circumstances, both cases have been included among the deaths from tuberculosis in the BCG vaccinated group. Of the 3,008 persons included in this study, approximately 85% were examined roentgenologically at the time of, or soon after, the injection of vaccine or isotonic sodium chloride solution.

REEXAMINATIONS

No distinction was made between the two groups either before or after their inclusion in this study. No isolation was attempted, and no modification was made in their mode of living. Both groups were examined at approximately annual intervals by the staff of the U. S. Indian Tuberculosis Control Unit, assisted by local Indian service medical personnel. The importance of the annual examination was stressed, and every effort was made to locate and to examine every person in the study by means of the tuberculin test and x-ray studies of the chest. The percentage reexamined annually by means of the tuberculin test and x-ray studies, as presented in table 3, indicates that a high proportion of those in the study were examined and is almost identical for both groups for any given year.

From 1941 to 1944 the reduction of the staff of the Tuberculosis Control Unit and the number of persons in the study who were either in the armed forces or working off the reservation resulted in a decrease in the percentage examined annually. By June, 1944, when the field work was temporarily discontinued, all groups had been followed for a minimum of six consecutive years and some had had seven annual examinations. In 1946-1947, tuberculin testing and x-ray examinations were again conducted in all areas. In that period, reexaminations were conducted on the Rosebud Agency and in Alaska for the 9th year after the initiation of the study and for the 10th and 11th year in the remaining areas. Consequently, following the sixth annual visit the percentage of persons reexamined each year is based on the number of cases in the area visited and not on the total of all persons included in the study.

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[8] Aronson, J. D.; Parr, E. I., and Saylor, R. M.: BCG Vaccine: Its Preparation and the Local Reaction to Its Injection, Am. Rev. Tuberc. 42:651, 1940.

At the time of each annual examination all persons were retested with 0.00002 mg. of purified protein derivative of tuberculin, and those who failed to react after 48 hours were reinjected with 0.005 mg. of the same preparation. As for the initial testing, all dilutions of purified protein derivative were prepared fresh daily with sterile isotonic sodium chloride solution, and no preservative was added to the concentrated or diluted solutions of purified protein derivative. At the time that the tuberculin test was made, or soon after, a roentgenologic examination of the chest was made by means of a mobile x-ray unit operated by the Tuberculosis Control Unit. The films were developed locally at each agency and were interpreted by the radiologist of the unit. Films were identified by number, and the radiologist had no information as to whether the film represented a vaccinated or control case, nor the results of the tuberculin test. At each annual visit to the different agencies, the medical records, x-ray films, and available laboratory reports of all those who had died the preceding year were examined in order to confirm the diagnosis. No diagnosis was accepted without a complete review of all available data.

Table 3.—*Percentages of BCG Vaccinated Persons and Controls Tuberculin Tested and Examined by X-Rays Each Year*

	Tuberculin Tested										
Year of Observation	1	2	3	4	5	6	7	8	9	10	11
BCG vaccinated persons	96.4	94.5	94.9	95.2	89.7	80.8	78.8	70.4	74.9	68.6	81.3
Controls	90.4	93.7	95.4	92.9	90.0	77.5	81.6	70.4	72.1	72.1	78.3
	Roentgenologic Examination										
Year of Observation	1	2	3	4	5	6	7	8	9	10	11
BCG vaccinated persons	97.4	96.8	96.1	95.9	91.2	84.1	81.8	71.6	76.8	69.0	80.2
Controls	96.8	96.4	96.5	93.9	91.5	81.8	84.1	76.3	72.2	72.1	78.2

EVALUATION

An evaluation of the effectiveness of BCG vaccine cannot be made by comparing current mortality and morbidity rates from tuberculosis with former rates. Such a comparison is not valid, principally because the rates have been decreasing for many years, especially among the younger age group. The significance of the results obtained in this study depends on the equality of the vaccinated and control groups, on the comparability of the number examined annually, on a comparable risk of exposure to tuberculous infection, and on use of the same diagnostic criteria. The comparability of both groups according to age and sex and the comparability of the follow-up have been presented in tables 1 and 3.

An analysis of the records for each household included in this study indicated that for the first six years 21.4 and 19.8% of the vaccinated and control groups, respectively, had been exposed to known domiciliary sources of tuberculosis, and that the degree of contact was essentially the same for both groups.[9] It must be realized that in any population, and especially in heavily infected populations, there are in addition to known domiciliary sources of infection, numerous opportunities for extra-domiciliary infection that cannot be determined accurately, but are nonetheless significant. That a significant percentage of the BCG vaccinated persons experienced superimposed infection with virulent tubercle bacilli is indicated by the increased sensitivity to tuberculin of the BCG vaccinated persons who were observed over a period of from 9 to 11 years. This increased tuberculin sensitivity was most marked in areas where the incidence and level of tuberculin reaction became high among the control group.[10]

The morbidity and mortality from tuberculosis and the mortality from all causes have been compared in both BCG vaccinated and controls, and the results after 3, 6, and 11 years of observation have been published previously.[11] With the completion of the reexamination of both groups in 1947, it was decided to discontinue the annual examinations, but to follow both groups at approximately five year intervals in order to determine the mortality rates from all causes and from tuberculosis.

In conformity with this policy a recheck of both groups was conducted in March and June, 1951, since 15 years had elapsed since the study was initiated. All of the areas were revisited, and, through the excellent cooperation of agency medical, and school personnel and through contacts with many who were contemporaries of those in the study, we were able to trace 1,534 of the 1,551 who had been vaccinated from 13 to 15 years previously, and 1,445 of the 1,457 controls. At the same time all available death certificates were checked, both at the hospital and at the agency office. If the patient had been hospitalized on or off the agency during his terminal illness, the clinical record, nurses' notes, and laboratory and roentgenologic reports were studied in order to determine as accurately as possible the cause of death.

If the record of every death among the persons in this study included a complete and careful clinical history, autopsy findings, complete laboratory examination, and unequivocal x-ray reports, the evaluation of the effectiveness of BCG vaccine would be more nearly conclusive. In the absence of such complete evidence for all deaths there remains one comparison not affected by diagnostic errors and that is the comparison of deaths from all causes in the vaccinated and control groups. Among the

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[9] Aronson, J. D., and Palmer, C. E.: Experience with BCG Vaccine in the Control of Tuberculosis Among North American Indians, Pub. Health Rep. **61**: 802, 1946.

[10] Aronson, J. D.: The Fluctuation of the Tuberculin Reaction in Different Geographic Areas and its Relationship to Resistance, Am. Rev. Tuberc. **63**: 121, 1951.

[11] Aronson.[10] Townsend, J. G.; Aronson, J. D.: Saylor, R., and Parr, E. I.: Tuberculosis Control Among the North American Indians, Am. Rev. Tuberc. **45**: 41, 1942. Aronson, J. D.: Protective Vaccination against Tuberculosis with Special Reference to BCG Vaccination, ibid. **58**: 255, 1948.

1,551 BCG vaccinated persons, who were observed for a total of 21,245.5 person years, there were 71 deaths from all causes, a rate of 3.34 per 1,000 person years of observation. Of the 1,457 controls, who were observed for a total of 19,520.5 person years, 128 persons died, a rate of 6.56 per 1,000 person years of observation. When the cumulative death rate from tuberculosis and nontuberculous causes are calculated on the basis of life table experience (table 4), the cumulative death rate from tuberculosis is found to be significantly higher for the controls than for the BCG vaccinated group. On the other hand, the cumulative death rates from nontuberculous causes for both groups are approximately the same. Among the BCG vaccinated group, beginning with the 10th to 11th year of observation, the increment in the cumulative death rate from tuberculosis is greater than in the earlier years of the study. Although the numbers involved are too small to be significant statistically, they do suggest that the initial increased resistance induced by the BCG vaccine may decrease after the 10th year.

TABLE 4.—*Cumulative Mortality from Tuberculosis and Nontuberculous Causes Per 1,000 Persons*

	BCG Vaccinated Persons						Controls					
	Deaths				Cumulative Mortality Rate per 1,000 Person Years		Deaths				Cumulative Mortality Rate per 1,000 Person Years	
Years of Observation	TB.[*] No.	Non-TB. No.	No. Untraced	Person Years Observed	TB.	Non-TB.	TB. No.	Non-TB. No.	No. Untraced	Person Years Observed	TB.	Non-TB.
0- 1	2	11	1	1,550.5	1.29	7.10	1	7	2	1,456.0	0.69	4.81
1- 2	0	3	0	1,537.0	1.29	9.03	5	9	2	1,446.5	4.14	11.00
2- 3	1	6	0	1,534.0	1.94	12.91	6	2	0	1,431.0	8.32	12.38
3- 4	1	5	0	1,527.0	2.59	16.14	2	7	0	1,423.0	9.72	17.28
4- 5	0	3	7	1,517.5	2.59	18.03	8	6	5	1,411.5	15.33	21.46
5- 6	0	1	0	1,511.0	2.59	18.68	4	2	0	1,395.0	18.15	22.86
6- 7	0	4	0	1,510.0	2.59	21.28	3	2	3	1,387.5	20.27	24.27
7- 8	1	6	0	1,506.0	3.25	25.18	5	3	0	1,381.0	23.82	26.39
8- 9	0	6	0	1,499.0	3.25	29.08	7	10	0	1,373.0	28.80	33.48
9-10	1	3	8	1,489.0	3.91	31.03	8	4	0	1,356.0	34.53	36.33
10-11	2	2	0	1,481.0	5.25	32.34	5	4	0	1,344.0	38.12	39.20
11-12	0	3	0	1,477.0	5.25	34.30	4	2	1	1,334.5	41.00	40.64
12-13	3	3	0	1,474.0	7.27	36.02	2	4	0	1,328.0	42.44	43.54
13-14	0	1	1	1,000.5	7.27	36.98	3	1	0	908.0	45.60	45.94
14-15	1	2	0	624.0	8.90	40.07	2	0	0	552.0	49.06	45.94
Totals	12	59	17				65	63	13			

[*] TB. = tuberculosis.

TABLE 5.—*Diagnostic Criteria[*] and Number of Deaths from Tuberculosis in BCG Vaccinated Persons and Controls*

	Pulmonary Tuberculosis		Miliary Tuberculosis		Tuberculous Meningitis		Pulmonary Tuberculosis and Meningitis		Tuberculous Peritonitis		Tuberculosis of Bones and Joints	
Diagnostic Criteria	BCG No.	Control No.	BCG No.	Control No.	BCG No.	Control No.	BCG No.	Control No.	BCG No.	Control No.	BCG No.	Control No.
X-ray pos. and sputum pos., for acid-fast bacilli	2[†]	15	0	8	0	0	1[¶]	0	0	0	0	0
X-ray pos., sputum neg., for acid-fast bacilli	2	3	0	0	0	0	0	0	0	0	0	0
X-ray pos., no laboratory examination	2[‡]	14	0	11[§]	0	0	0	0	0	0	1	2
X-ray pos., pleocytosis of spinal fluid	0	0	0	0	0	0	0	1	0	0	0	0
X-ray neg., lab. exam. pos., acid-fast bacilli	0	0	0	0	3[‖]	2	0	0	0	2[¶]	1	0
X-ray neg., no laboratory examination	0	0	0	0	0	2	0	0	0	1	0	0
X-ray neg., pleocytosis of spinal fluid	0	0	0	0	0	4	0	0	0	0	0	0
Total	6	32	0	19	3	8	1	1	0	3	2	2

[*] Pos. = positive. Neg. = negative.
[†] One died 24 hours postoperatively.
[‡] One had a negative reaction to purified protein derivative of tuberculin one year after vaccination.
[§] One was confirmed by autopsy.
[‖] Two were confirmed by autopsy, one by positive postvaccinal Koch phenomenon.
[¶] Koch phenomena after vaccination.

In the absence of routine autopsies the designation of cause of death was based, as previously mentioned, on clinical records (which were available for all but a few cases), nurses' notes, x-ray interpretations, laboratory examination of sputum or spinal fluid, and an occasional autopsy. The criteria that were used to establish the diagnosis of tuberculosis in both the BCG vaccinated and the control groups are listed in table 5.

Of the 12 deaths from tuberculosis among the BCG vaccinated group, 2 occurred in persons who gave a marked Koch phenomenon at the time of examination, as noted earlier in this paper. One died three months after vaccination from tuberculous meningitis, and the other died nine years later from pulmonary and meningeal tuberculosis. One death occurred in a child who had been vaccinated with a sample of vaccine of low potency and failed to react to tuberculin one year after vaccination. One death was due to postoperative hemorrhage and spontaneous pneumothorax 24 hours following a thoracoplasty, and at autopsy moderately advanced tuberculosis was found.

It is valid to include deaths from tuberculosis among those of the vaccinated group who were already infected at the time of BCG vaccination, as indicated by a postvaccinal Koch phenomenon 48 hours later, since it is conceivable that some of the control cases may have undergone similar tuberculous infection in the interval between the initial negative tuberculin reaction and the administration of isotonic sodium chloride solution.

INFLUENCE OF HYPERSENSITIVITY ON FATAL TUBERCULOSIS

The study afforded the unique opportunity of studying not only the epidemiology of tuberculosis but also the influence of hypersensitivity on the occurrence of fatal tuberculosis in a population known to be free from tuberculosis at the beginning of the study. The correlation of hypersensitivity with the different forms of fatal tuberculosis is presented for vaccinated persons and controls in table 6 and is related to the time of appearance of a positive tuberculin test.

Of the 32 controls who died from pulmonary tuberculosis, a total of 23 reacted to tuberculin, either during the year of death or in previous years. Six persons who previously had negative reactions to tuberculin had positive reactions during the year in which they died, while three persons had had negative reactions when tested three to six years previously. Of the 31 who died from the acute generalized forms of tuberculosis, such as miliary tuberculosis, tuberculous meningitis, tuberculous meningitis associated with pulmonary lesions, or tuberculous peritonitis, only 8 had reacted to tuberculin previous to and during the year of death, 8 reacted to tuberculin for the first time during the year in which they died, 4 were previously tuberculin negative and remained negative in the year they died, while 11 who were not tested within the year of death had previously failed to react to tuberculin. Although the numbers involved are relatively small, it is evident that the acute forms of tuberculosis occurred more frequently among those who had escaped a previous tuberculous infection, as indicated by a failure to react to tuberculin.

TABLE 6.—*Relationship of Different Types of Fatal Tuberculosis to Hypersensitivity in BCG Vaccinated Persons and Controls*

	Pulmonary Tuberculosis		Miliary Tuberculosis		Tuberculous Meningitis		Pulmonary Tuberculosis and Meningitis		Tuberculous Peritonitis		Tuberculosis of Bones and Joints		Totals	
Reaction to Purified Protein Derivative	BCG	Control	*BCG*	*Control*	*BCG*	*Control*	*BCG*	*Control*	*BCG*	*Control*	*BCG*	*Control*	*BCG*	*Control*
Pos. year of death and previously pos.	2	9	0	1	0	2	0	0	0	0	0	0	1	12
Not tested year of death and previously pos.	4	14	0	3	1	0	1	0	0	2	2	0	9	19
Pos. year of death, neg. previously	0	6	0	5	1	2	0	0	0	1	0	1	1	15
Neg. year of death, neg. previously	0	0	0	1	1	2	0	1	0	0	0	0	1	4
Not tested year of death, neg. previously	0	3	0	9	0	2	0	0	0	0	0	1	0	15
Total	6	32	0	19	3	8	1	1	0	3	2	2	12	65

TABLE 7.—*Number of Deaths from Tuberculosis and from Nontuberculous Causes in BCG Vaccinated Persons and Controls by Age and Sex in Five Year Periods*

	Tuberculous				Nontuberculous			
	BCG		Controls		BCG		Controls	
Attained Age	Males	Females	Males	Females	*Males*	*Females*	*Males*	*Females*
Under 5	1	0	1	0	3	7	4	7
5- 9	0	0	1	4	5	2	8	5
10-14	1	2	4	10	6	4	6	6
15-19	1	2	10	16	11	6	8	5
20-24	1	2	8	10	4	7	9	3
25-29	2	0	0	1	2	2	0	2
Totals	6	6	24	41	31	28	35	28

The relation of hypersensitivity to fatal tuberculosis is masked to some degree among the vaccinated. This is due to the hypersensitivity that follows BCG vaccination. This type of hypersensitivity differs, in general, from that following infection with virulent tubercle bacilli. The postvaccinal tuberculin reaction is characterized by a diffuse area of redness or pigmentation and slight edema, and in about 50% of cases the reaction is negative or doubtful to the first dose of tuberculin. In persons who have a tuberculous infection or a superimposed tuberculous infection following vaccination with BCG, a well-marked local inflammatory reaction follows intracutaneous injection of the first dose of tuberculin. The redness is more intense and the edema is sharply localized and indurated. The edematous area measures from 1 to 3 mm. in thickness. This type of reaction is often associated with a central area of blanching.

Of the six vaccinated persons who died from pulmonary tuberculosis, five had an increased hypersensitivity greater than that observed one year after vaccination at some time during the course of the study, and one showed a strong tuberculin reaction one year following vaccination. Of the three who died from meningitis, one has been mentioned previously as showing a Koch phenomenon 48 hours after vaccination and one reacted strongly to 0.00002 mg. of purified protein derivative one year after vaccination; the other was not tested during the year of death, but the postvaccinal tuberculin reactions in previous years were of the type induced by BCG vaccine. The person who died from pulmonary and meningeal tuberculosis reacted strongly to 0.00002 mg. of purified protein derivative one year postvaccinally; a Koch phenomenon had also been observed in this case 48 hours after vaccination. The two who died from tuberculosis of bones and joints showed an increased sensitivity to tuberculin. It is significant that while 19 of the 65 tuberculous deaths among the controls were due to acute miliary or similar tuberculosis and three to tuberculous peritonitis, not a single instance of these forms of acute tuberculosis occurred among the vaccinated.

INFLUENCE OF SEX AND AGE ON FATAL TUBERCULOSIS

It is well recognized that the mortality rate from tuberculosis differs in males and females at different ages. Putnam [12] has analyzed statistically the mortality from tuberculosis according to sex over the period from 1870 to 1920. She found that the death rate from this disease was higher among females during the age period 5 to 24 years and that this difference was most marked at the age period 10 to 14, when three females to every male died from this disease. The number of deaths from tuberculosis among the vaccinated group is too small to be statistically significant. Among the controls it will be noted from table 7 that a significantly larger number of females than males died from tuberculosis during the attained age period of 5 to 19 years.

COMPARISON OF NONTUBERCULOUS DEATHS AMONG VACCINATED PERSONS AND CONTROLS

The significance of our observations dealing with the specific protective value of BCG vaccine is further emphasized by the comparability of the number of deaths from nontuberculous causes. A total of 59 of the 1,551 vaccinated persons and 63 of the 1,457 controls died from nontuberculous causes. On a basis of person years of observation the mortality rate is 2.77 and 3.17 per 1,000 person years of observation for the vaccinated and controls, respectively. Deaths from nontuberculous causes, both among vaccinated persons and controls (table 7), are comparable and show no selection by sex or age group. Among the 31 vaccinated males and 34 control males who died from nontuberculous causes, 16 and 19 deaths, respectively, were due to accidents or war injuries. Of the 28 vaccinated and 28 control females who died, 4 and 7 respectively died as a result of accidents. The deaths from nontuberculous causes are presented in table 8 and are correlated with the x-ray interpretation of the chest findings.

Of the 63 controls who died from nontuberculous causes, 40 or 63.5% failed to react to both 0.00002 and 0.005 mg. of purified protein derivative in previous tests; 12 or 19% reacted to 0.00002 mg., and 11 or 17.4% reacted to 0.005 mg. Of the 59 BCG vaccinated persons who died from nontuberculous causes, 11 had negative reactions on their initial prevaccinal test and died before they were retested, while of the remaining 48 persons, 25 or 52% reacted to 0.00002 mg. of purified protein derivative and 23 or 48% to 0.005 mg. The nature of the tuberculin reaction in the vaccinated was on the whole characteristic of the postvaccinal type of reaction.

The similarity of the number and distribution of deaths from nontuberculous causes by sex and age in the vaccinated and controls is a further indication that the sampling of the two groups 13 to 15 years previously was comparable, and that no intentional or unintentional bias has been introduced. A comparison of the deaths in both groups from tuberculous and nontuberculous causes indicates that the lower total death rate among the vaccinated group is due to the specific reduction of the tuberculosis rate.

DISCUSSION

The original objection to the use of BCG vaccine as an immunizing agent against tuberculosis was doubt as to the stability of the avirulence of the BCG culture. The claims of Petroff [13] that the BCG culture has regained its virulence was not confirmed by other investigators. One of us (J. D. A.) has conducted many different studies dealing with the virulence and antigenicity of the BCG culture from 1928 to the present time. During this period we have observed fluctuations in the tuberculogenic property and variations in some of the biological characteristics of the BCG culture, but at no time have we observed progressive tuberculosis in guinea pigs even when they were injected intraperitoneally with as much as 30 mg. moist weight of the culture. Although the studies of Vorwald [14] indicate that both the avirulent BCG and R_1 strains of the tubercle bacillus produce extensive pulmonary lesions in guinea pigs exposed over a long period of time to inhalations of silica dust, the cultures isolated from such lesions remain avirulent.

Table 8.—*Number and Causes of Nontuberculous Deaths Among BCG Vaccinated Persons and Controls Correlated with Interpretation of Roentgenograms of Chest*

	X-Ray of Chest Negative		X-Ray of Chest with Nontuberculous Lesions	
Diagnosis	Vaccinated No.	Control No.	Vaccinated No.	Control No.
Accidents	19	22	1	6
Adenitis, cervical, acute	0	0	0	1
Agranulocytosis	1	0	0	0
Anemia, hemolytic	0	0	0	1
Brain abscess	1	0	0	0
Diabetes	1	0	0	0
Diphtheria	0	1	0	0
Embolism, post partum	1	0	0	0
Empyema	0	1	0	0
Encephalitis	0	1	0	1
Endocarditis	5	4	1	2
Enterocolitis	1	1	0	0
Goiter, toxic	0	1	0	0
Hepatitis, acute	0	0	0	1
Hemorrhage, post partum	0	1	0	0
Intestinal obstruction	0	1	0	0
Lymphosarcoma	1	0	0	0
Malnutrition	0	0	0	1
Meningitis, acute, nontuberculous	3	2	0	0
Myocarditis	1	0	0	0
Nephritis	0	1	0	0
Otitis media	0	0	1	0
Peritonitis, acute	2	2	0	1
Pneumonia, bronchial	2	1	2	1
Pneumonia, lobar	1	3	1	1
Poliomyelitis	1	0	1	0
Ruptured ectopic pregnancy	1	0	0	0
Shock, postoperative	2	2	0	0
Status epilepticus	1	0	0	0
Typhoid	0	1	0	0
Undiagnosed	2	1	1	1
Uremia	3	0	0	0
Totals	49	46	8	17

The much-quoted Lübeck tragedy, in which 73 of 251 infants vaccinated per os died from tuberculosis, cannot be used as an argument for increased virulence of the

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[12] Putnam, P.: Sex Differences in Pulmonary Tuberculosis Deaths, Am. J. Hyg. 7: 663, 1927.

[13] Petroff, S. A.: A New Analysis of the Value and Safety of Protective Immunization with BCG (Bacillus Calmette-Guérin), Am. Rev. Tuberc. 20: 275, 1929.

[14] Vorwald, A. J.; Dworski, M.; Pratt, P. C., and Delahant, A. B.: BCG Vaccination in Silicosis, Am. Rev. Tuberc. 62: 455, 1950.

BCG strain. The evidence presented before the German court indicated that the deaths were not due to BCG vaccine, but to vaccine prepared from contaminated or accidentally substituted virulent culture used in the same laboratory.[15] The culture isolated from these infants proved to be a virulent, human-type tubercle bacillus known as the "Kiel strain." The identification of this culture was made by the German investigators on the basis of its virulence and on the fact that this culture produces a characteristic green color when grown in liquid medium.

If one were to assume that BCG vaccine does not increase resistance, that the vaccine contained virulent organisms or that its virulence increased in the body, then one might expect that its wide use throughout the world, in many instances among those living under the most adverse conditions, would have increased the mortality rate from tuberculosis. From all reports this has not happened. Speaking objectively, it appears from the experience and extensive investigations of those who have used BCG vaccine in the laboratory and in the field that there is no evidence, after 25 years of use, of any return of virulence of the BCG culture. In view of the intensive studies throughout the world and despite numerous reports dealing with the harmlessness of the BCG culture, it is surprising to read, "The amount of scientific work reported to prove its harmlessness in man is almost nil." [16]

The evaluation of the protective role of BCG vaccine against tuberculous reinfection is complicated by the decrease in the tuberculosis mortality rate since 1863. The rapid decrease in the tuberculosis death rate over the past 25 years is strikingly illustrated by the decrease in the mortality rate from tuberculous meningitis in New York City and Philadelphia. Between 1923 and 1949, inclusive, the rate for this disease decreased in New York from 5.8 per 100,000 to 1.0 per 100,000, while in Philadelphia it decreased from 7.1 per 100,000 to 1.2 per 100,000. This decrease occurred despite the fact that the proportion of nonwhite persons in these cities increased during this period.

Whatever the cause or causes of the decrease in the mortality from tuberculosis, it is obvious that mortality rates from one period cannot be compared with those of another to determine the value of BCG vaccine or any other control measure. Because of this, only controlled studies can provide objective data from which final conclusions may be drawn. Since there is no correlation between resistance to tuberculous reinfection and the titer of humoral antibodies, the value of BCG vaccine cannot be estimated by any of the usual serologic methods. In the absence of a more accurate yardstick, the development and persistence of hypersensitivity has been used as a measure of increased resistance, based on recognition that hypersensitivity and resistance show a close but not absolute relationship. This concept is supported by the observation of comparable vaccinated and control groups over a period of from 13 to 15 years. Mortality from tuberculosis among the BCG vaccinated, approximately 90% of whom showed persistent hypersensitivity for 11 years after vaccination, was significantly less than the tuberculosis mortality among the controls, whose incidence of hypersensitivity increased from 12 to 42% in the same period of time. Of special significance are our findings that the acute hematogenous forms of tuberculosis occurred with but few exceptions among the controls, many of whom had been tuberculin negative on the last test or within a year of death. The collected data from this controlled study fail to furnish any evidence to support the thesis that hypersensitivity favors the development of destructive forms of tuberculosis, even where the risk of tuberculous infection is high.

That the hypersensitivity resulting from BCG vaccination may mask hypersensitivity due to spontaneous infection with virulent tubercle bacilli is a valid objection to its general use, especially in areas where the incidence of tuberculous infection is low. Observations of tuberculin reactions in vaccinated and unvaccinated groups over a period of many years show that in general it is possible to differentiate between the tuberculin reaction following BCG vaccination and that following spontaneous infection with tubercle bacilli. In BCG vaccinated persons the level of sensitivity is low; approximately 50% react to 0.01 mg. of old tuberculin or to 0.00002 mg. of purified protein derivative, and the remainder will react to 0.1 mg. or 1.0 mg. of old tuberculin or to 0.005 mg. of purified protein derivative. It will be noted that in the vast majority of instances after 48 to 72 hours the local reaction appears as a diffuse red or reddish purple area, approximately 8 to 20 mm. in diameter, associated with slight and ill-defined edema or absence of any palpable edema. With increasing time the zone of reaction becomes purplish and persists for several weeks. The tuberculin reaction following spontaneous infection can be elicited in 80 to 90% of cases by intracutaneous injection of 0.01 mg. of old tuberculin or 0.00002 mg. of purified protein derivative. The reaction in these cases is characterized by a well-defined area of redness and a sharply defined elevated area of edema and induration, measuring 1 to 3 mm. in thickness, often associated with a central area of blanching, vesiculation, or necrosis.

SUMMARY AND CONCLUSIONS

The value of BCG vaccine in controlling tuberculosis was determined in a number of groups of Indians in the United States and Alaska. School and preschool age children, all of whom were negative to tuberculin, were placed by an alternate division of cards into one of two groups. These groups were comparable in numbers, age, and sex. The members of one group received a single intracutaneous injection of freshly prepared BCG vaccine and were not revaccinated during the study. The second group received an intracutaneous injection of isotonic sodium chloride solution and served as controls. Neither group was isolated before or after vaccination, and no change was made in their mode of living. Both groups were followed to the same degree annually for the first 9 to 11 years of the study by means of tuberculin tests and roentgenologic examination of the chest.

The mortality from all causes and from tuberculosis was determined 15 years after the study was initiated. The cause of death was based on roentgenologic and laboratory examinations, clinical records, nurses' notes, and personal interviews with relatives in those few cases in which diagnosis had not been established. In no instance was the death certificate diagnosis accepted without further careful investigation. During the 13 to 15 years of observation a total of 71 vaccinated and 128 controls died from all causes. Among the 1,551 vaccinated persons observed for a total of 21,245.5 person years, 12 died from tuberculosis, a rate of 0.56 per thousand person years of observation. Among the 1,457 controls observed for a total of 19,520.5 person years, 65 died from tuberculosis, rates of 3.32 per thousand person years. Among the vaccinated persons and controls 59 and 63, respectively, died from nontuberculous causes, rates of 2.77 and 3.22 per thousand person years of observation, respectively. Of the 12 deaths from tuberculosis among the vaccinated group, 6 were due to pulmonary tuberculosis, 2 to bone and joint tuberculosis, 3 to tuberculous meningitis, and 1 to tuberculous meningitis and pulmonary tuberculosis. Among the 65 unvaccinated controls, 32 died from pulmonary tuberculosis, 2 from bone and joint tuberculosis, and a total of 31 from acute miliary or similar forms of tuberculosis, including tuberculous peritonitis. The tuberculin reactions of those controls dying from acute forms of tuberculosis were for the most part negative within the year of death or had become positive for the first time within that period.

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[15] Lübecker Tuberculose: Prozess, abstract of legal proceedings, Ztschr. f. Tuberk. 63:452, 1932.

[16] Myers, J. A.: Immunity in Tuberculosis, J. A. M. A. 146:1492 (Aug. 18) 1951.

The observed data over a period of 13 to 15 years support the concept that there is a close but not absolute relationship between resistance to reinfection and hypersensitivity. Hypersensitivity among the vaccinated, of whom 12 died from tuberculosis, ranged from 93.3% one year following vaccination to 90.2% 11 years later. Among the controls, 65 of whom died from tuberculosis, hypersensitivity increased from an incidence of 12.7% one year after the initiation of the study to 41.7% after 11 years.

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FURTHER STUDIES ON TULAREMIA IN THE OZARKS

REVIEW OF FORTY-FOUR CASES DURING A THREE-YEAR PERIOD

W. C. Corwin, M.D.
and
S. P. Stubbs, M.D., Fayetteville, Ark.

In 1948 Bost, Percefull, and Leming[1] published a paper reviewing 54 cases of tularemia seen at this hospital, half of whom had been seen before streptomycin was available and half of whom had been treated with this antibiotic. The present paper is a study of 44 additional patients treated at this hospital during a three year period ending Dec. 31, 1950. A report of these cases may seem unimportant per se, but we feel that the ineffectiveness of aureomycin that we encountered should be brought to the attention of the medical profession.

Foshay,[2] who with Pasternack[3] first reported the successful clinical use of streptomycin in tularemia, has recently recommended streptomycin and dihydrostreptomycin as the drugs of choice, but he states that aureomycin appears to have been effective in a few cases of average severity. He adds that chloramphenicol (chloromycetin®) has been used experimentally and gives good indication that it may be valuable in this disease. E. S. Miller[5] is of the opinion that streptomycin is the drug of choice, but "that in a very limited clinical trial, aureomycin also appears to be an effective therapeutic agent for tularemia." He adds that whether aureomycin will have an advantage over streptomycin remains to be determined. Keefer and Hewitt[6] stated in 1948, "Streptomycin is, by universal agreement, the currently preferred agent for the treatment of tularemia." Yet Long[7] in a 1950 review of the antibiotics felt that in tularemia aureomycin is the drug of choice, with streptomycin second, and that the effect of chloramphenicol is yet unknown. Spink and Hall[8] speak only of streptomycin as a therapeutic agent and make no mention of aureomycin. On the other hand, Taylor,[9] in reporting 35 cases from the Army and Navy General Hospital in Hot Springs, Ark., leads the reader to believe that aureomycin is quite as effective as streptomycin in the treatment of this disease.

We concluded from our experience with aureomycin that it is every bit as effective in securing remissions as streptomycin or dihydrostreptomysin but that its curative effect cannot compare with that of the other two antibiotics. This experience has been largely responsible for the preparation of this paper. It is of interest that 8 of our 44 patients had very satisfactory remissions following courses of aureomycin with dosage ranging from 8 gm.

From the Medical Service, Veterans Administration Hospital.

Reviewed in the Veterans Administration and published with the approval of the Chief Medical Director. The statements and conclusions published by the authors are the result of their own study and do not necessarily reflect the opinion or policy of the Administration.

1. Bost, R. B.; Percefull, S. C., and Leming, H. E.: Tularemia in Ozarks Region, J. A. M. A. **137**: 352 (May 22) 1948.
2. Foshay, L., in Conn, H. F.: Current Therapy, Philadelphia, W. B. Saunders Company, 1950. Foshay, L., in Kyser, F. A.: Therapeutics in Internal Medicine, New York, Thos. Nelson & Sons, 1950.
3. Foshay, L., and Pasternack, A. B.: Streptomycin Treatment of Tularemia, J. A. M. A. **130**: 393 (Feb. 16) 1946.
4. Deleted on proof.
5. Miller, E. S., in Harrison, T. R., and others: Principles of Internal Medicine, New York, The Blakiston Company, 1950.
6. Keefer, C. S., and Hewitt, W. L.: The Therapeutic Value of Streptomycin: A Study of 3,000 Cases, Ann Arbor, Mich., Edwards Brothers, Inc., 1948, pp. 165-171.
7. Long, P. H.: Clinical Use of Antibiotics, M. Clin. North America, pp. 307-318, 1950.
8. Spink, W. W., and Hall, W. H.: Streptomycin, in Watson, C. J.: Outlines of Internal Medicine, ed. 6, Dubuque, Iowa, William C. Brown Company, 1949.
9. Taylor, R. R.: Report on Tularemia: Its Diagnosis and Treatment, J. Arkansas M. Soc. **47**: 47, 1950.

in four days to 12 gm. in six days. Seven of these returned to the hospital in from five to nine days with exacerbations, including chills and fever. Only one did not return, and he had had 15 gm. in 10 days. One patient received both aureomycin and chloramphenicol and had a satisfactory cure. Two patients had remissions with penicillin, but recrudescences necessitated short courses of dihydrostreptomycin, which resulted in cure. Since seven additional patients entered the hospital late in the course of the disease with almost no symptoms, the physician in charge judged that specific therapy was not indicated. All patients in this series who received either streptomycin or dihydrostreptomycin, whether initially or following remissions, were cured.

Of these cases, nearly all were farmers. Etiologically, in 28 cases the organisms were tick-borne; 7 cases were due to contact with rabbits, and 9 were of undetermined origin. Thirty-four were of the ulceroglandular type, five, pneumonic, four, combined ulceroglandular and pneumonic, and one, unclassified. The patient in the last case had a typhoidal course, and no localization of the disease could be made. The peak temperatures during hospitalization in this series ranged from 98 to 105.6 F, with an average of 101.8 F. Agglutinations occurred in dilutions ranging from 1:320 to 1:10,240, the latter titer being the highest used routinely in this hospital. In one patient, who had an apparent cure except that satellite glands remained enlarged, the agglutinations were followed in higher titers, and at one time the titer was 1:327,080.

The average dosage of streptomycin or dihydrostreptomycin was 6 gm. in six days. Keefer and Hewitt[6] believe that "the most cogent reason for administering only enough streptomycin to meet clinical requirements, especially in a disease with a low mortality rate of 7.4%,[10] is the well-documented knowledge that the smaller the total dosage, the fewer the significant toxic reactions."

Thirty-three of our cases occurred in May, June, July, and August. The duration of illness prior to admission ranged from 1 to 56 days, with an average of 12 days. It is of interest that patients in 1950 came for treatment in the first few days of illness, whereas in 1948 they had come only after several weeks. Word of the occurrence of tularemia has apparently spread to such an extent that the patients themselves or their families or friends quickly suspect what their trouble might be. Patients with the ulceroglandular type had their primary lesions in various areas, the scrotum, flank, or thigh (with inguinal node involvement) rating first, and chest or axillary folds (with axillary node involvement) rating second. Defervescence reactions with streptomycin, dihydrostreptomycin, or aureomycin were nearly identical in the ulceroglandular type, occurring in one to three days with an average of one and one-half days, while in the pneumonic type defervescence was much delayed.

Since this report includes only hospitalized patients, it represents simply a sampling of the total number of cases of tularemia. The Fayetteville Veterans Administration Hospital draws patients from sections of Kansas, Missouri, and Oklahoma as well as from Arkansas. The patients treated in this series came from the following counties: one each from Delaware and Latimer counties, Oklahoma; one each from Polk, Lawrence, Newton, Douglas, and Howell counties, Missouri; two from McDonald county, Missouri; six from Barry county, Missouri; one each from Carroll and Sabastian counties, Arkansas; two each from Baxter, Washington, Crawford, Franklin, and Johnson counties, Arkansas; four from Madison County, Arkansas; four from Polk County, Arkansas; and eight from Benton County, Arkansas.

The counties in this area from which no cases were reported may well have had many patients with tularemia, but, as in all public health problems, it is difficult to determine what happened to them. They may well have been adequately treated at home by their local physicians, have entered other hospitals, obtained nontherapeutic cure, or died. Indeed, many of our patients told us of similar illnesses among their families or neighbors.

One patient warrants special mention, because he typifies the common diagnostic pitfalls and because he underwent remission while receiving penicillin followed by recrudescence while still undergoing therapy with the same drug.

REPORT OF A CASE

L. B. H., a 41-year-old farmer, was readmitted to this hospital in April, 1950, for a postgastrectomy recheck. While he was traveling on the bus from his home some 60 to 70 mi. away, chills and fever developed. On admission to the surgical service his temperature was 101.4 F. The accompanying chart tells the story graphically. Penicillin, 50,000 units every three hours, brought the temperature to normal on the 8th day, and it was not until the 14th day that it rose to 102.2 F. On the 15th day the temperature rose to 103 F, whereupon administration of aureomycin and dihydrostreptomycin was instituted in addition to the penicillin. On the 16th day a medical consultation was requested. The internist suspected infectious mononucleosis or tularemia.

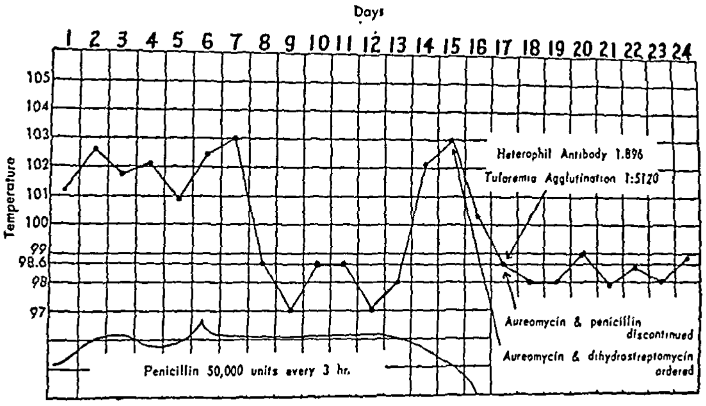

Chart showing course of patient in case reported. *He had skinned a rabbit one week before admission.*

The laboratory reports the following morning revealed a positive heterophil agglutination in a titer of 1:896 and a positive agglutination for tularemia in a titer of 1:5,120. The internist then discontinued administration of all antibiotics except dihydrostreptomycin, and recovery ensued. The patient was seen in January, 1951, at which time the agglutination for tularemia was 1:1,280. His heterophil agglutination was negative. We are of the opinion that his original positive heterophil agglutination was of the Forrsman type and that he did not have concomitant infectious mononucleosis.

SUMMARY AND CONCLUSIONS

Tularemia appears to be endemic in the Ozarks and in the majority of cases is tick-borne. It is stressed that streptomycin and dihydrostreptomycin are the drugs of

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10. Francis, E.: Streptomycin in Treatment of Tularemia, Tr. A. Am. Physicians 60: 181, 1947.

choice in treatment of this disease. The present series plus the series of Bost and his colleagues [1] makes a total of 71 patients treated successfully at this hospital with these agents. Some of these patients were seriously ill. Seven of eight patients treated with aureomycin had prompt remissions, which were followed by recrudescences necessitating the use of streptomycin or dihydrostreptomycin.

CORONARY ARTERY DISEASE

John F. Briggs, M.D., St. Paul

In this article I will use the terms "coronary artery disease," "angina pectoris," "coronary insufficiency," and "heart pain" interchangeably and synonymously. Angina pectoris can be manifested by almost any kind of pain and results from a disproportion between the oxygen demand and the oxygen supply of the myocardium. On this basis, many factors may operate in angina pectoris. It may be the result of: 1. Coronary sclerosis, coronary ostial closure, or inflammatory changes in the coronary arteries. 2. Chronic severe anemia or acute anemia, when the blood is unable to carry oxygen to the myocardium, or when the patient is suffering from chronic carbon monoxide poisoning. 3. A severe disease of the mitral or aortic valves, when the minute volume output of the heart cannot be maintained under exertion. Here the stroke volume is so decreased that, no matter how rapidly the rate may increase, the total output of blood per minute never reaches that needed for full coronary filling. 4. In cases of failure to maintain the mean aortic pressure, as well as a disturbance in the filling of the coronary arteries. This particular mechanism comes into play when the anginal syndrome is associated with aortic insufficiency and when the anginal syndrome is found in association with paroxysmal tachycardias or other rapid heart rates. 5. Cases in which there is a disproportion between the blood supply and the greatly hypertrophied heart muscle. It is obvious that many factors may be active in producing angina pectoris and that coronary artery disease itself may be minimal or even absent.

Heberden's original description of the onset of angina pectoris was sudden substernal pain associated with a constricted feeling around the chest, with distress radiating down the left arm and causing a feeling of impending death. If, however, the diagnosis of angina pectoris is to be limited to patients presenting that syndrome, many patients who have the disease will be overlooked. Many patients do not have pain underneath their sternum. Instead, they have a feeling of fulness, of there being a gas bubble present, a squeezing beneath their chest bone, fulness in the chest, and a burning sensation under the chest bone; or they may have no pain or distress, just an uncomfortable feeling. The radiation of the pain may also be confusing in that the pain may radiate to the left shoulder and stop there or to the left arm or the left forearm or finger tips. The pain, however, may not radiate to the left but up into the angle of the jaw or directly to the back, to the upper right quadrant of the abdomen, or to the epigastrium; and with this radiation, if associated with belching and dyspepsia, it is difficult to distinguish between gastrointestinal disease and coronary artery disease. Also, the somatic expression of the referred pain may be variable. The afferent fiber of the pain arc is the vagus, and the pain is referred out through the cervical sympathetic nerves to various portions of the body, thus precipitating the somatic effect produced by the coronary insufficiency. These patients, instead of having pain in the left arm and the other typical symptoms, may have a muscular phenomenon. This is the explanation of the severe, knife-like, constricting pain that occurs in these patients around the chest. It is due to spasm of the intercostal muscles. Often there is a vascular phenomenon, and, instead of pain occurring in the left arm, the fingers blanch and turn white, as in secondary Raynaud's disease. On the other hand, the reflex arc may affect the glandular system. These patients break out with severe sweating or salivation. It may be that the lumbar sympathetic nerves are stimulated and involved in referred pain, and the patient has a desire to defecate or to void. Often a painless variant occurs at night, namely, paroxysmal nocturnal dyspnea, which represents an attack of coronary insufficiency. Furthermore, there may be absolutely no pain in the chest itself, and the only distress occurs at the point of ordinary pain reference. A patient may have pain limited to the epigastrium or the upper right quadrant of the abdomen and have absolutely no pain beneath the chest itself. Sometimes the patient has pain in the left wrist, blanching of his fingers, a heavy feeling across his shoulders, or a heavy feeling in his arms, and yet he has no pain underneath the breast plate. Then again, the patient may have pain without pain; that is, he may have all of the characteristic signs and symptoms of suffering, yet cannot tell you why, other than that he has a definite feeling of weakness. This great variation in the pattern of coronary artery disease symptoms frequently makes the diagnosis of the disease difficult. One can, however, make the diagnosis in these patients if one remembers that, regardless of the type of distress and regardless of where it occurs, it is always the result of either physical exertion or an emotional upset. The emotional upset that occurs may be of a pleasant nature, or it may be one associated with emotional distress and grief, but in either case it may precipitate coronary pain.

Angina pectoris may occur at any age. It has been known to be present in infants, but the frequency increases with advancing years. It is a disease of both sexes, commoner in men than in women, and it produces more distress in men than in women. It is a disease that affects all economic levels. There is no good evidence to demonstrate racial differences in angina pectoris nor to indicate any relationship between coronary disease and diet or

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Read before the Section on Diseases of the Chest at the One-Hundredth Annual Session of the American Medical Association, Atlantic City, June 15, 1951.

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One patient warrants special mention, because he typifies the common diagnostic pitfalls and because he underwent remission while receiving penicillin followed by recrudescence while still undergoing therapy with the same drug.

REPORT OF A CASE

L. B. H., a 41-year-old farmer, was readmitted to this hospital in April, 1950, for a postgastrectomy recheck. While he was traveling on the bus from his home some 60 to 70 mi. away, chills and fever developed. On admission to the surgical service his temperature was 101.4 F. The accompanying chart tells the story graphically. Penicillin, 50,000 units every three hours, brought the temperature to normal on the 8th day, and it was not until the 14th day that it rose to 102.2 F. On the 15th day the temperature rose to 103 F, whereupon administration of aureomycin and dihydrostreptomycin was instituted in addition to the penicillin. On the 16th day a medical consultation was requested. The internist suspected infectious mononucleosis or tularemia.

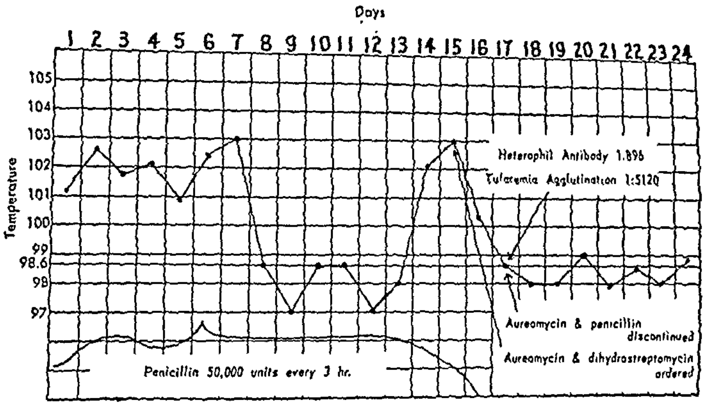

Chart showing course of patient in case reported. He had skinned a rabbit one week before admission.

The laboratory reports the following morning revealed a positive heterophil agglutination in a titer of 1:896 and a positive agglutination for tularemia in a titer of 1:5,120. The internist then discontinued administration of all antibiotics except dihydrostreptomycin, and recovery ensued. The patient was seen in January, 1951, at which time the agglutination for tularemia was 1:1,280. His heterophil agglutination was negative. We are of the opinion that his original positive heterophil agglutination was of the Forrsman type and that he did not have concomitant infectious mononucleosis.

SUMMARY AND CONCLUSIONS

Tularemia appears to be endemic in the Ozarks and in the majority of cases is tick-borne. It is stressed that streptomycin and dihydrostreptomycin are the drugs of has coronary thrombosis and the collateral circulation is rather poor, there would be no blood flow to the area supplied by the artery, and ischemic necrosis would take place, which is a myocardial infarct. In severe coronary artery disease, prolonged coronary insufficiency associated with exertion may be of such an extent that the decreased oxygen supply to the heart muscle will produce a necrosis within the heart muscle, and this necrosis, or infarction, then occurs without coronary thrombosis. When coronary thrombosis develops in a patient, he is seized with severe constrictive chest pain, he breaks out with a cold sweat, he goes into shock, his blood pressure falls, his pulse becomes very rapid and weak, and he becomes acutely ill. If this occurs without a myocardial infarction, after a few hours the entire picture disappears and the patient is quite well and apparently none the worse for the seizure. If, on the other hand, a myocardial infarction occurs, there is, in addition, an elevation of temperature, increase in the white blood cell count, increase in the sedimentation rate, usually a pericardial friction rub, urobilinogen in the urine, and electrocardiographic tracings that are diagnostic. The same is true of the patient who has the myocardial infarction without a coronary thrombosis. Here the pain pattern is not quite so severe, but otherwise the picture is exactly the same as that of the patient who has had a coronary thrombosis with infarction. A coronary thrombosis, with or without an infarction, differs from angina pectoris in that there may be no relationship to exertion, whereas angina is related to exertion. The patient with angina pectoris tends to be quiet, whereas the patient with coronary thrombosis is apprehensive and thrashes about to some extent. The blood pressure rises in angina pectoris and falls in coronary thrombosis with infarction. The pulse becomes rapid in angina pectoris and becomes weak in coronary thrombosis. The patient with angina pectoris does not have the profound shock appearance, nor does he run a fever. He does not have the elevated white blood cell count or the elevated sedimentation rate. He does not have a pericardial friction rub, and he does not have urobilinogen in the urine. The electrocardiogram shows very temporary or no changes.

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[10] Francis, E.: Streptomycin in Treatment of Tularemia, Tr. A. Am. Physicians 60: 181, 1947.

Once the patient sustains a myocardial infarction with a coronary thrombosis, he is put to bed, given oxygen, 1/4 grain (15 mg.) morphine sulfate, with 1/150 grain (0.12 mg.) atropine sulfate as needed until he is sedated. If he has thromboembolic phenomena immediately, he is given heparin and bishydroxycoumarin (dicumarol®) simultaneously, with administration of heparin being stopped on the third day but with administration of bishydroxycoumarin continuing thereafter. The patient receives in addition a 1,200 calory soft diet, his bowels are kept open with "petro-syllium," he is allowed to use a commode, and he is catheterized, if necessary. Should the patient show congestive heart failure, he is digitalized and treated with mercurial diuretics. He remains in bed until all signs and symptoms of the infarction have disappeared; namely, until clinical and physical signs have disappeared, the electrocardiographic tracings remain stationary, the sedimentation rate is normal, and the white blood cell count is normal. The patient is then permitted to get out of bed and is given graduated exercises. He returns to work when there is no evidence of any active heart disease. He is permitted to return to any and all activity, depending on whether he has congestive failure or whether he has angina. The patient's activities are limited to the physical limitation of his disease following the coronary thrombosis.

SUMMARY

Angina pectoris may be manifested as almost any kind of pain and results from a disproportion between the oxygen requirement and the oxygen supply to the heart muscle. It may be the result of some disease within the heart or the coronary arteries, of the inability of the blood to carry oxygen to the heart, of some disturbance in the minute volume output of the heart such as found in valvular heart disease, of a fall in the mean aortic blood pressure as seen in paroxysmal tachycardia and aortic insufficiency, or of a disproportion between the muscle bulk of the heart and the blood vessels supplying the muscle. The pain or distress is variable and may mimic other forms of chest pain or chest diseases. It has, however, the following pattern that is the common denominator for making the diagnosis, namely, that the pain follows or is associated with physical exertion or emotional excitement and that it is relieved by rest and glyceryl trinitrate (nitroglycerin). In the patients with angina pectoris the diagnosis must be made entirely by history. There are no pathognomonic signs nor pathognomonic laboratory tests to establish the diagnosis. In some of these patients a coronary thrombosis will develop with or without myocardial infarction, or an infarction may develop alone. When this occurs, the patient must be kept in bed. He must receive morphine sulfate in adequate doses and oxygen if needed. He must be placed on a bland diet. Anticoagulants are used if necessary, so that the prothrombin activity is about 20 to 30% of normal. He is digitalized, and mercurial diuretics are used as needed. The patient remains at rest until all signs and symptoms of the infarction disappear. He then does graduated exercises and returns to his activities. Should he have anginal pain, limitation of his activities is governed by the pain. He may do anything he wishes that does not produce the pain. He is taught to use glyceryl trinitrate dissolved under the tongue, 1/200 grain (0.3 mg.) when required to relieve the pain and to use it prophylactically, if necessary, when he knows the coming events will precipitate an attack of pain. Those persons who have paroxysmal nocturnal dyspnea, which is a variant of angina, may be treated by using prophylactically one of the mercurial diuretics once or twice a week, injecting 1 or 2 cc. intramuscularly. In the patient who has postprandial pain we find that the addition of phenobarbital sodium, ½ grain (30 mg.), plus atropine sulfate, 1/150 grain (0.4 mg.), to sodium bicarbonate (Sippy powder) taken three times a day after meals will often relieve the attacks of pain. Finally, it is important in this disease to pay more attention to what you hear from the patient than what you hear through a stethoscope and more attention to what you see in the patient than to what you see in an electrocardiogram.

350 St. Peter St.

J.A.M.A., May 24, 1952

CLOSED FOSSA TONSILLECTOMY

A METHOD FOR REDUCING POSTOPERATIVE BLEEDING

Ernest B. Emerson Jr., M.D., Rochester, N. Y.

The literature contains an enormous amount of material dealing with hemorrhage occurring after tonsillectomy. All aspects of the problem have been investigated from the strictly postoperative point of view, with some improvement in the situation. Yet each year fatal and nearly fatal hemorrhages continue to occur. In the past, these hemorrhages have been attributed to changes in barometric pressure, presence of infection, the menstrual period, salicylates, blood dyscrasia, blood pressure, and many other causes, including even the season of the year. It is the purpose of this paper to show, on the basis of anatomical study and experience in 634 cases, that such hemorrhages are unnecessary if the techniques of modern surgery, long neglected by otolaryngologists, are applied to the problem. It is postulated that such hemorrhages are due to none of the causes mentioned but rather to a hole in a blood vessel, as is the case elsewhere in the body. Such hemorrhages can be prevented by proper closure of the wound and well-selected antibiotic therapy.

ANATOMY

The main vessels entering and leaving the tonsil fossa have been adequately described elsewhere; however, the actual distribution of the blood vessels in the tonsil fossa has not received proper emphasis. Many surgeons who do dissection tonsillectomies are probably vaguely aware that the vessels enter the fossa and that the larger ones sometimes continue for some distance up and down the floor of the fossa. In order to ascertain more exactly the distribution of these vessels, dissections were done on several head and neck preparations, the veins and arteries of which had been filled with brightly colored plastic dye. These dissections were carefully done on reasonably fresh material. It was observed that only occasionally does a vessel of any size enter the tonsil directly from the floor of the fossa. The larger vessels, as they enter the fossa, enter directly into an anastomosis, which, as the tonsil is dissected away, is seen to lie on the superficial layers of the fascia and muscle forming the floor of the fossa. The network of vessels runs lengthwise in the fossa. The branches from the anastomotic network entering the tonsil proper are very small. Those entering the pillars of the fossa are of capillary size, a fact that makes it possible to close the fossa without including the pillars, thus obtaining a normal looking throat and still, with properly placed sutures, preventing postoperative hemorrhage entirely or at least rendering it as controllable as it is in any well-handled surgical wound.

TECHNIQUE

The operative procedure, depending as it does on the application of good surgical dissection, of necessity eliminates the use of many of the older types of instruments, such as Beck or Nesbit snares or the tonsillotomes of the Sauer, Daniel, or LaForce techniques, to avoid leaving tonsil tissues in place, especially near the lower pole. The anesthesia of choice is ether given through a Davis-Crowe or McIvor gag with the patient in a modified Rose position, thus eliminating, as nearly as possible, pulmonary complications (in this series there were none), yet attaining maximum visibility of the tonsil region. Local anesthesia may be used, but the inability of the patient to hold his mouth open wide enough and quiet enough for good suturing makes the job difficult.

Once the gag is in place, the tonsil is grasped with a tenaculum, and an incision is made through the mucous membrane at the upper pole on the anterior pillar. This is widened by blunt dissection with scissors until there is room enough for insertion of a pillar retractor, at which point the scissors are replaced by a blunt dissector; this latter step eliminates any desire on the part of the operator to hurry his dissection using a slightly open scissors. This is important if no tags are to be left behind. Blunt dissection is carried through to the lower pole. Then, and only then, a snare is used, the tonsil root being strongly pulled medially; a cold wire snare of the Tydings type is used to remove the tonsillar extensions into the tongue. If the operator prefers, complete removal of the tonsil may be accomplished by dissection alone. After removal of the first tonsil, the fossa may be packed and the same procedure carried out on the opposite side; however, there is no objection to sewing up the fossa directly, and if bleeding is rather profuse, especially in a child, it is the procedure of choice.

Suturing is usually but not necessarily begun at the lower pole. On consideration of the anatomy involved it becomes apparent that the sutures must enter at the point where the tonsillar pillar joins the true floor of the fossa. Usually this is more easily done at the point where the posterior pillar meets the floor of the fossa. The needle is then passed under the true floor of the fossa and is brought out as near to the junction of the anterior pillar and fossa as possible. The suture is then tied. If the surgeon prefers, four or five interrupted sutures will usually give a clean even closure, with no undue tension on the pillars (*B, C,* and *D* in accompanying figure).

The choice of the suturing technique will vary with the surgeon; some will prefer interrupted sutures, others perhaps two to three figure-of-eight sutures, and still others a continuous suture. I usually use two to three sutures on each side of the throat, tying each as the ligature is placed, thus offering an opportunity to place each new stitch in the immediate proximity of any brisk bleeding. It should be borne in mind that the floor of the fossa should be tented up with a clamp to allow a maximum amount of room between the floor of the fossa and the structures beneath. Over a period of six years, I have done 634 tonsillectomies in all of which the fossa was closed in the manner described. The patients were of all ages, and 308 were males and 326 were females (see table).

From the Department of Surgery, Division of Otolaryngology, University of Rochester School of Medicine and Dentistry.

COMMENT

I realize that the material in this paper constitutes a break with the traditions of tonsil surgery and will, therefore, be controversial. Certain questions and criticisms have already been voiced by my immediate associates. It seems to me, for this reason, that a brief discussion of these matters is appropriate.

Operation.—The average time required to complete the operation and the suturing is about thirty minutes for an adult and twenty minutes for a child. It has been asked if this is not an unnecessary prolongation of anesthesia; however, in these days of modern surgery and anesthesia, in which chest surgeons and brain surgeons operate for four to eight hours without ill effects on the patient, this seems to be an unnecessary worry. More important still, if the need for a secondary anesthesia to control hemorrhage can be prevented, then the extra time is more than justified. I use plain "0" catgut for suturing, but the choice is largely up to the surgeon.

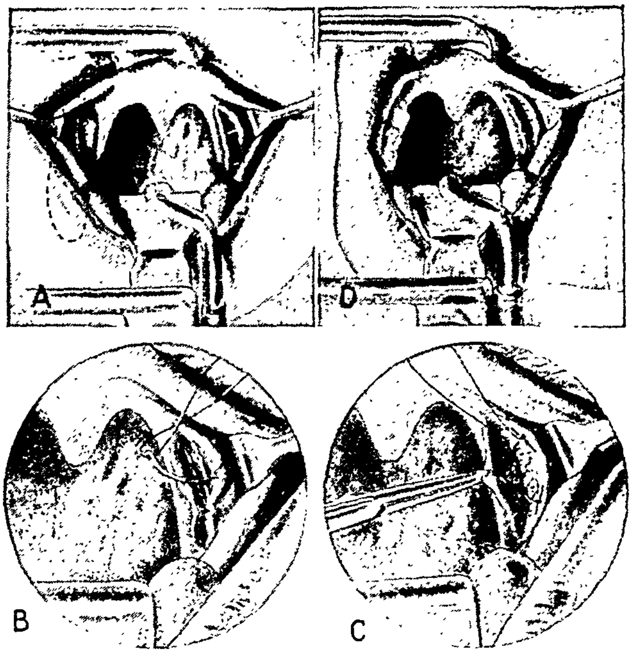
Postoperative Course.—The postoperative course is shortened, as might be expected, because the size of the area left to heal is greatly reduced (*A* in figure). Children more often than not eat fair sized breakfasts the morning after the operation. The ease of swallowing tends to make the postoperative febrile period shorter and the fever reported minimal, since these patients do not tend to dehydrate as much as those in whom the fossa is left wide open. The average child's throat heals by the end of five days, and most adult patients can be back at work by the end of a week. Nausea and vomiting are reduced to a minimum, because, with the wound closed, there is no ooze of blood to be swallowed.

Age Distribution of 634 Patients Treated by Closed Fossa Tonsillectomy

Age, Yr.	No. of Patients
Birth to 3	67
4- 5	190
6-10	154
11-15	33
16-20	52
21-30	83
31-40	22
41-50	22
51-60	11
Total	634

The question has been raised as to the danger from buried tonsil tags. If the tonsil is removed by careful blunt dissection by a competent surgeon, the number of remnants of tonsil tissue should be minimal. In the six years that this work has been in progress there have been no complications of this sort. If care is exercised in placing the sutures so that there is no undue tension placed on the posterior pillar, the voice is not affected by the closed fossa technique. In the group of cases reported there were seven professional singers, and all seven reported no damage to the voice. In this series there were no pulmonary complications. If sufficient care is exercised in positioning the patient on the operating table and if proper use of the suction is made during the operation, there should be none. The need for sedation is considerably reduced in both children and adults. This in itself tends to minimize pulmonary complications.

Except in the case of accidents, no hemorrhage should occur. In this series there were two cases of hemorrhage caused by accident. One occurred in a 65-year-old man who jammed his lower dental plate into the right tonsil fossa and tore out the sutures. The other occurred in a 7-year-old girl who, on the third postoperative day, slipped away from her mother to go swimming and, in diving off the high diving tower, landed with her mouth open and tore out the sutures on the right side. The so-called late bleeders do not occur, simply because, with the fossa closed, the bed of granulations from which these hemorrhages arise does not form; in other words, the wound heals by primary intention. The closed fossa technique does not, of course, eliminate the possibility of bleeding from the adenoid bed in cases in which both tonsils and adenoids have been removed. In this series there were four cases of such bleeding; two were severe enough to warrant transfusions. With the closed fossa technique there should be no fatalities from hemorrhage, once the operative procedure has been mastered. There were none in this series. I would like to point out, however, that this is a very real risk in the older methods of tonsillectomy. While it is practically impossible to obtain accurate figures on this problem, it is apparent from the few figures available that in any large city the number of deaths due to postoperative hemorrhage is nearly comparable to the number due to poliomyelitis.



A, tonsil fossa open (left) and closed with sutures (right). Dotted lines indicate relative extent of raw surface left to heal by the two techniques. *B*, interrupted suture technique for closing tonsil fossa. Needle begins at junction of the posterior pillar and fossa proper, passes just beneath the vessels, and emerges at the junction of the anterior pillar and the floor of the fossa. *C*, continuous suture technique for closing tonsil fossa. *D*, tonsil fossa closed with interrupted sutures; note that pillars are not included in the closure.

With the throat at rest, the fossa from which a tonsil has been recently removed becomes a dead space. General surgeons, for years, have preached the precept that such dead spaces should, if possible, be closed. The closed fossa technique satisfies this precept, and healing is therefore more rapid. Surgeons have learned to close the wound in pilonidal cyst cases rather than wait through the long process of letting the wound fill in by granulation; the same principle applies in the case of the tonsil fossa.

Postoperative infection has been no problem in this series. No drugs were given in any of the cases until 1951. Because of a mild flu epidemic during the spring of 1951, all patients were given 300,000 units of procaine penicillin G on the day of and the day after the operation as a prophylactic measure. It was found that this medication tended to result in a much cleaner throat, and, by minimizing the number of Vincent's organisms present, the postoperative foul breath of the tonsillectomy patient could be practically eliminated. For this reason, penicillin has been given in succeeding cases. Patients were advised against the use of acetylsalicylic acid in any form; however, the use of the drug in gum has become so much of a habit with the lay public that a large number of patients did use it. Vitamin K was routinely given to combat the effects of the unknown quantity of the drug that was ingested. With the tonsil wound closed, no hemorrhages resulted.

SUMMARY AND CONCLUSIONS

1. A method for closure of the tonsil wound that is based on the anatomy involved and on recognized surgical precepts is described. This method prevents hemorrhage after tonsillectomy in all cases except those in which an actual accident occurs. The success of the closed fossa technique depends on the ability of the operator to do a clean dissection of the tonsil. This technique automatically eliminates the need for instruments of the guillotine techniques.

2. The danger of hemorrhage and its emotional impact on both the patient and his family can and must be eliminated. With the introduction of the closed fossa tonsillectomy technique, the patient has a right to expect and obtain surgical treatment performed in a manner that satisfies the fundamental precepts of good surgery. The physician can confidently reassure his patients concerning hemorrhage, and he should look askance on the occurrence of postoperative hemorrhage, barring the occasional case caused by accident.

26 Strathallan Park.

PHYSIOLOGICAL OPERATION FOR IDIOPATHIC CONGENITAL MEGACOLON (HIRSCHSPRUNG'S DISEASE)

David State, M.D., Minneapolis

The striking clinical features, the unique pathological findings, and the evasiveness of the etiological factors have made idiopathic congenital megacolon (Hirschsprung's disease) a provocative and stimulating enigma. Recent observations by Whitehouse and Kernohan [1] and Swenson and co-workers [2] have resulted in a better understanding of the pathogenesis of this disease and have permitted a more rational approach to its treatment. The purpose of this paper is to discuss our experiences with 15 patients in whom colonic function was studied by means of fluoroscopy and roentgenograms, after the administration of a barium enema. As a result of these studies, a new surgical approach to the treatment of Hirschsprung's disease, which has given excellent results in the patients so treated, was devised.

ETIOLOGY

Since Hirschsprung's report before the Berlin Congress for Children's Diseases, in 1886,[3] many theories as to the cause of this disease have been advanced. For the most part, these theories have postulated the presence of some obstructing mechanism, such as valves,[4] localized aplasia,[5] torsion of the bowel,[6] or kinking [7]; however, careful study has failed to reveal any obturating mechanism other than the fecal contents within the lumen of the colon. The possibility that alterations of the ganglion cells of the myenteric plexus play an important role in the genesis of Hirschsprung's disease was first suggested by the studies of Dalla Valle, in 1920 [8] and 1924.[9] He found the ganglion cells of the myenteric plexuses normal in appearance and number in the cecum and the ascending, transverse, and descending colon, but, in more than 100 sections of the sigmoid colon, no nerve cells were found. Similar findings were reported by Cameron,[10] Robertson and Kernohan,[11] and Tiffin, Chandler, and Faber.[12] In 1948, Whitehouse and Kernohan [1] published the results of their study of 11 cases of congenital megacolon and 5 cases of secondary megacolon. The ganglion cells were absent in the myenteric plexuses in the most distal portions of the colon in all patients with true congenital megacolon. The authors postulated the existence of a functional obstruction at the level of the absence of ganglion cells, with secondary dilatation and hypertro-

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From the Department of Surgery of the University of Minnesota Hospitals.

Several illustrations and an additional case report have been omitted from THE JOURNAL and will appear in the author's reprints.

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phy of the proximal colon. By means of colonic motility studies with use of a multiple balloon technique, Swenson and his co-workers [13] presented evidence supporting the concept of faulty transmission of peristaltic waves across a narrow rectosigmoidal area and, in addition, thought that the rectum was abnormal in its behavior. As a result of these studies, Swenson advocated the removal of the rectosigmoid and almost the entire rectum, with anastomosis of the sigmoid colon to a small residual section of the rectum immediately above the internal sphincter by a pull-through technique.[14] In the group of 52 patients in whom this technique was used, there was only one postoperative death; the other patients were apparently cured. Bodian and co-workers [15] and Hiatt,[16] utilizing slight variations of Swenson's procedures, also reported good results. Hiatt, however, stated that there were leaks at the anastomosis in 7 of the 22 patients, and, in some patients, there was impairment of sphincter action, as well as recurrences of bowel dilation and symptoms of megacolon.

FUNCTIONAL ACTIVITY OF BOWEL AS DETERMINED BY ROENTGENOGRAMS

Neuhauser [2] reemphasized the important roentgen findings in patients with congenital megacolon. By injecting only a small amount of barium, with examination of the patient in an oblique position, he clearly demonstrated a narrow segment of colon interposed between the rectum and the dilated sigmoid in all patients with true congenital megacolon. Roentgen studies of our patients have confirmed Neuhauser's findings, and, in addition, we have noted the following facts (fig. 1). 1. The rectum has a normal caliber. 2. The right side of the colon, that is, the cecum, the ascending colon, and variable extents of the transverse colon show good haustral markings and evidence of normal contractility. 3. The left side of the colon, i. e., the descending and sigmoid colon, are markedly dilated and show no evidence of haustral markings or peristaltic activity. These three points are extremely important. They have governed the extent of colonic resection in our patients. The portions of the colon that are dilated and show no peristaltic activity roentgenographically are removed. The rectum is retained, and an anastomosis between it and the right side of the transverse or ascending colon, which shows good peristaltic activity roentgenographically, is carried out.

OPERATIVE PROCEDURES

Since these patients had suffered many years of chronic ill health, their nutritional status was impaired, and special attention was directed toward getting them in the best possible condition for operation. They received high caloric diets, with vitamin supplements, and, if indicated, repeated whole blood and plasma transfusions were given to elevate the plasma protein level. It was important to take as much time as necessary to clean out the colon completely, preoperatively, and this sometimes took many days. For three days prior to operation, the patient was given aureomycin hydrochloride, 500 mg. four times a day orally, in order to decrease the intestinal bacterial flora. An intravenous solution of 5% glucose in distilled water was injected into the arm before operation, and, since it has been shown that many of these patients have idiopathic dilatation of the urinary bladder, all patients had an urethral catheter inserted immediately after being anesthetized. The anesthetic used was a thiopental (pentothal®)-curare solution in all the patients except one, in whom a spinal anesthetic, supplemented with a thiopental sodium-curare solution, was used.

A left paramedian incision was made from the symphysis pubis well up into the epigastrium (fig. 2*A*). In our first two patients, the "hockey stick" incision was used, because some difficulty in mobilizing the splenic flexure was anticipated, but, in this group and in subsequent patients, it was noted that the splenic flexure was mobile and offered no problem in mobilization. When the paramedian incision was used, care was taken to keep the rectus muscle intact.

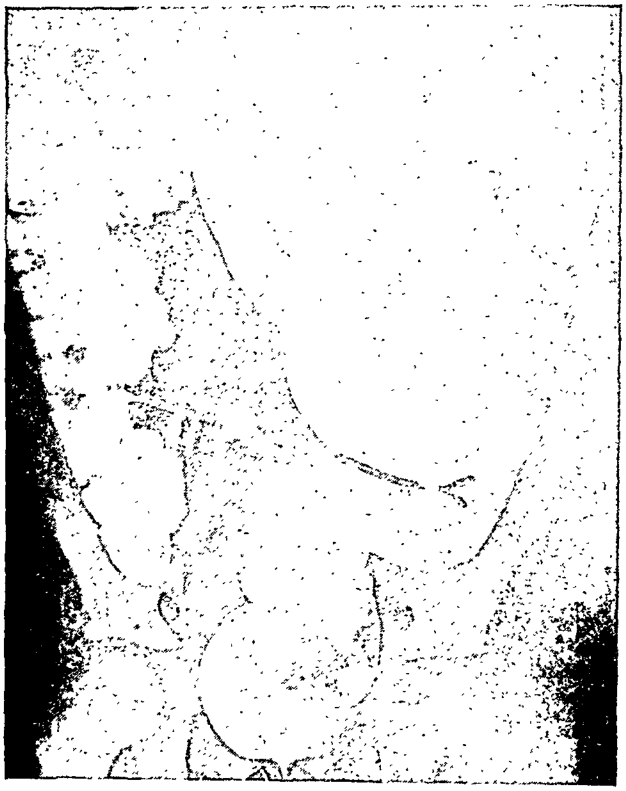

Fig. 1.—Roentgenogram of the colon of a 4-year-old patient with congenital megacolon. Note the (1) normal appearance of the rectum, (2) the "narrowed" rectosigmoid area, (3) the widely dilated left side of the colon, showing no haustral pattern, and (4) the undilated cecum and the ascending and portions of the transverse colon, also showing a good haustral pattern.

EXTENT OF RESECTION

The proximal extent of resection (fig. 2*B*) in all patients was determined preoperatively by means of roentgenograms. At laparotomy, with the entire colon exposed, the findings corroborated those obtained by roentgenograms. The rectal ampulla was of normal thickness and diameter. The "narrowed" area between the rectum and the dilated sigmoid was of varied length but was present in all patients with true congenital megacolon. The division between the dilated left side of the colon (sigmoid, descending, and variable portions of the left side of the transverse colon) and the right portion of the colon was often clearly seen, particularly if care was taken not to push gas and stool back from the dilated sigmoid on mobilization of the latter. The level of transection of the bowel on the right side could be readily identified, for, at this level, the bowel was of normal thickness, and the longitudinal muscular bands were normally placed so as to produce haustrations. In 13 patients, this level of proximal transection was in the right half of the transverse colon; in the other 2, it was in the ascending colon, just proximal to the hepatic flexure in 1 patient, and in the left side of the transverse colon in the other, as determined fluoroscopically. In all instances, the colon was removed proximal to the most distal area of active peristalsis. This was done in order to avoid any error in utilizing bowel of questionable peristaltic activity. The distal line of resection was the upper rectum. The colon between the proximal and distal line of resection was removed, with careful ligature of the vessels in the mesentery close to the bowel. Definition of the normal rectal ampulla was made in all instances without difficulty and with as little dissection of the rectum as possible. This was done for two reasons: (1) to prevent injury to the nervi erigentes and (2) to avoid producing a large space between the rectum and hollow of the sacrum, which predisposes to perirectal infection and leakage at the line of anastomosis.

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[16] Hiatt, R. B.: Surgical Treatment of Congenital Megacolon, Ann. Surg. 133: 321, 1951.

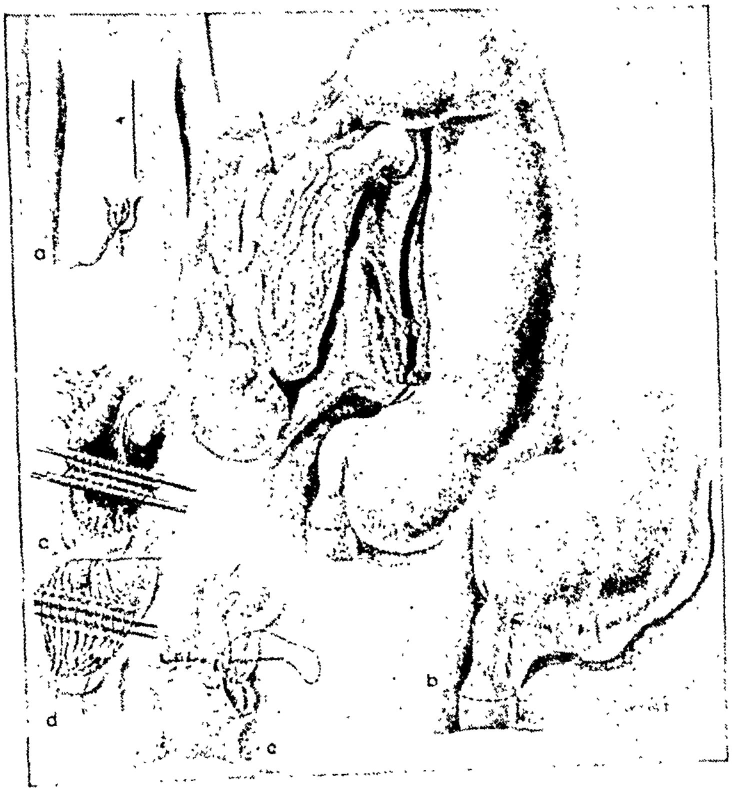

Fig. 2.—(*A*) A left paramedian incision is used. The rectus muscle is kept intact and retracted laterally. Note the inlying catheter. Frequently idiopathic dilatation of the urinary bladder is present in these patients and unless the bladder is emptied will interfere with the pelvic dissection and anastomosis of the colon to the rectum; (*B*) The proximal line of resection is depicted as being just beyond the hepatic flexure and the distal line is through the rectal ampulla, just beyond the "narrowed" rectosigmoid; (*C*) The posterior row of no. 40 silk sutures has been placed and is ready for tying. (*D*) The sutures in the posterior row have been tied and cut. The clamps have been rotated and the anterior row of sutures have been inserted. These are drawn up so the clamps are removed, and then they are tied. (*E*) Extraperitonealization of anastomosis.

A closed, one layer type of anastomosis [17] was made, using Wangensteen's intestinal anastomosis clamps (fig. 2*C* and 2*D*). Interrupted no. 40 silk sutures were inserted in the Lambert fashion. Because of the long length of the rectal stump, there were no particular technical difficulties with the anastomoses. The levels of the anastomoses were between 6 and 10 cm. from the anal skin. After the anastomoses were completed, a rubber catheter was introduced from below and placed into the proximal colon for decompression purposes. Great care was taken to extraperitonealize the anastomosis (fig. 2*E*). In two patients, difficulty was encountered in bringing down the transverse colon to the rectum, because the distance between the upper abdomen and the pelvis is greater than normal in patients with megacolon. In these patients, the midcolic artery was clamped at its origin, and, after the collateral circulation was found to be good, the vessel was transected and tied. This resulted in the additional length needed to do the anastomosis without tension.

No attempt was made to close off the bare areas made by removing the descending and sigmoid colons and their respective mesenteries. At the level of the anastomosis, before closure, 1 gm. of streptomycin and 500,000 units of penicillin were routinely deposited within the peritoneal cavity. A nasal tube was left in the stomach for decompression purposes for approximately 48 hours after the operation. Closure of the abdominal wound in layers was carried out by the use of interrupted no. 30 silk ("deknatal"). Postoperatively, the patients received fluids parenterally, and dihydrostreptomycin and penicillin for the first four days. Early ambulation was practiced. The rectal tube was partly removed on the third day and completely withdrawn on the fourth day. The urethral catheter was removed on the third day and was reinserted if the residual urine measured more than 75 cc.

RESULTS

A total of 15 patients were operated on in the manner described above. There were no deaths and no leaks at the line of anastomosis.[18] The postoperative course was, for the most part, uncomplicated in all the patients. The clinical results in 14 patients were excellent, in that they had daily bowel movements without the aid of enemas or cathartics. The other patient, whose recovery could be rated only as good, experienced several bouts of abdominal distention and constipation after surgery; however, he responded well to enemas and again started having spontaneous bowel movements. The follow-up period of these patients ranged from six months to three years. Postoperatively, barium enemas showed good peristaltic activity and emptying of the residual colonic segment (fig. 3, 4, and 6). There was marked improvement in the general health and physical endurance in all patients operated on. In those patients who were still growing, there was a rapid increase in height and weight. The personalities of the patients also improved dramatically. The patients' ages ranged from 2 to 21 years. The oldest patient, now a university student, was checked from the standpoint of sexual function and was found to be normal, in that he had erections, and examinations of the semen showed a normal number of active and normal appearing sperms.

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[17] Wangensteen, O. H.: Aseptic Gastric Resection: A Method of Aseptic Anastomosis Adaptable to Any Segment of the Alimentary Canal (Esophagus, Stomach, Small or Large Intestine): Including Preliminary Description of Subtotal Excision of the Acid Secreting Area for Ulcer, Surg., Gynec. & Obst. **70**: 59, 1940.

[18] Two patients with pseudomegacolon and megarectum experienced leaks at the line of anastomosis, necessitating proximal colostomies. Both made good progress after colostomy, but, as yet, the colostomies have not been closed.

REPORT OF CASES

CASE 1.—G. K. was first seen at the University Hospitals in June, 1945, at the age of 5 weeks. He showed symptoms suggesting intestinal obstruction, and a laparotomy was performed. A volvulus was found, and 10 in. (25.40 cm.) of the sigmoid colon were resected, leaving a double-barrelled colostomy. The colostomy was closed in approximately two weeks, and the patient experienced marked abdominal distention. The abdominal cavity was explored again, approximately one week after closure of the colostomy. The anastomosis was found to be patent, but there was marked dilatation of the bowel, proximal to the line of anastomosis. No further reactions or anastomoses were done, and the patient was treated by means of repeated enemas and cathartics and was discharged in September, 1945, under reasonably good control. He was readmitted in October, 1946, because of recurring bouts of abdominal distention and intestinal obstruction. A laparotomy was done, at which time a diagnosis of congenital megacolon was made and a transverse colostomy was formed. After this, the patient improved considerably. He was well until May, 1947, at which time the colostomy closed spontaneously, and he again experienced intestinal obstruction. He was readmitted to the hospital; the colostomy was opened; and his symptoms subsided. Because of colostomy retraction and intestinal obstruction, he was readmitted to the hospital on June 27, 1947, at which time the transverse colon was brought up on the anterior abdominal wall over two glass rods placed through the mesocolon, with an effort to prevent retraction of the colon. It was noted that the transverse colon was decidedly thickened and dilated. Proctoscopic examination revealed no definite evidence of obstruction at the line of anastomosis, although there was a slight narrowing there. A no. 30 French catheter, however, easily passed through the anastomosis into the dilated colon proximally. After the transverse colostomy, the patient made good progress. On Sept. 28, 1948, the colostomy was closed. The patient got along well until January, 1949, when he again experienced vomiting and abdominal distention that could not be controlled by enemas. He returned to the hospital for examination on Feb. 15, 1949, at which time marked abdominal distention, with visible peristaltic waves was noted. The rectum, however, on examination was empty, and the flat plate of the abdomen showed marked distention of both large and small bowels. After active preoperative preparation, on March 3, 1949, the patient was again taken to the operating room; the narrowed rectosigmoid region was removed; and an anastomosis was made between the transverse colon and the rectum, 7 cm. from the anal skin. Postoperatively, the patient did well and on March 27 was discharged, 17 days postoperatively, at which time he was having three to four loose stools a day, regularly. He failed to keep his appointment in our outpatient department and was not seen again until Nov. 20, 1950, at which time he was having two stools a day without enemas and was active and appeared normal in every way. He had gained 14 lb. (6.4 kg.) and had grown 7½ in. (19.05 cm.) since his operation. Examination revealed the laparotomy scars, but there was no evidence of distention. Unfortunately, it was not possible to administer a barium enema at that time.

This child had the typical history of a patient with symptoms of intestinal obstruction beginning soon after birth; he was treated for a volvulus of the sigmoid before a definitive diagnosis of megacolon was made. Although an anastomosis was done between the transverse colon and the sigmoid and there was no definite evidence of obstruction at the line of the anastomosis, whenever his colostomy was closed, the proximal bowel distended, and he showed symptoms of intestinal obstruction, with marked abdominal distention. During the patient's last operation, the previous anastomosis was found to be patent, but there was a residual narrowed area of the rectosigmoid, approximately 5 cm. in length. This area was resected, and the transverse colon was brought down to the rectum. This experience is similar to that noted by others who have anastomosed the transverse colon to what appears to be normal sigmoid. After the removal of the narrowed sigmoid area, although the same proximal colon was utilized, by anastomosing it to the rectum, distal to the narrowed area, the patient has apparently been cured of his difficulty. The fact that he has no intestinal obstruction and has daily bowel movements, even though the rectum remains, substantiates the contention that it is not necessary to remove the rectum so long as the narrowed sigmoid area is removed and the actively contracting bowel is brought down and anastomosed to the residual rectal stump.

CASE 2.—R. F., a 21-year-old white man, was admitted to the University Hospitals on Sept. 28, 1949, and was discharged on Oct. 8, 1949. He was first seen at the University Hospitals in 1930, with a history of chronic constipation and abdominal distention since birth. He was acutely ill, with high fever, vomiting, and intestinal obstruction; he was successfully treated by means of hot water enemas administered by Dr. A. Friedell of our pediatric staff.[19] He got along reasonably well with medical therapy consisting of daily enemas, cathartics, and, for some time, methacholine (mecholyl®) bromide, without prolonged relief. He was first seen by us for the consideration of surgery on Aug. 29, 1949, and, although he had daily evacuations by means of enemas, he felt that he could no longer attend school, because he was unable to administer the enemas himself, away from home. He was admitted to the hospital on Sept. 28, 1949, and physical examination revealed a pronounced abdominal distention and definite flaring of the costal margin. Roentgenograms of the large bowel revealed the typical narrowed area in the region of the distal sigmoid and marked dilatation of the proximal sigmoid colon (fig. 6). After adequate preoperative preparation, laparotomy, was performed Sept. 29, 1949, at which time the sigmoid colon was found to be tremendously dilated and thickened. This process extended to the proximal one-third of the transverse colon, where a transformation from the abnormal to the normal texture of the bowel occurred. The narrowed area of the rectosigmoid was about 7 to 8 cm. long, but, distal, to this, the rectal ampulla had a normal transverse diameter. Resection of the colon, distal to the hepatic flexure and down to the rectal stump, was carried out; anastomosis was then made between the ascending colon and the rectum, about 7 cm. from the skin margin. Postoperatively, the patient made good progress and had spontaneous bowel movements, which were liquid at first, but, within a month after operation, they had become well formed. He was last seen on Dec. 11, 1950, at which time he had two to three well formed stools a day and had gained approximately 14 lb. (6.4 kg.) since operation. He was able to attend school and was also employed part-time; he handled both responsibilities without difficulty. A roentgenogram of the bowel, after a barium enema on Dec. 11, 1950, showed excellent contractility and emptying of the residual colonic pouch (fig. 8 and 9).

In this patient, the oldest in our present group, the involvement of the bowel, as determined by means of roentgenograms, apparently extended to the proximal one-third of the transverse colon, but, in order to insure an actively contracting colonic segment for the anastomosis, it was necessary to utilize the ascending colon and to anastomose this to the rectum. The patient's postoperative response was gratifying.

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[19] Friedell, A.: Congenital Megacolon Treated by Daily Hot Irrigations of Normal Saline Solutions at 115 Degrees, Minnesota Med. **21**: 175, 1938.

CASE 3.—L. A., a 16-year-old white boy, was admitted to the University Hospitals on Oct. 23, 1949. He had a history of constipation since birth and required enemas for daily evacuation. A diagnosis of congenital megacolon was made, and, at the age of 3 (in 1936), a lumbar sympathectomy was done. This was followed by relief for three weeks, but the original symptoms of constipation reappeared. The patient experienced intestinal obstruction and generalized convulsions in June, 1940, and was treated by intestinal decompression and the vigorous use of enemas. He was given methacholine bromide, but, because of reactions and because no spontaneous evacuation of the bowel occurred, this medication was discontinued. By means of enemas, it was possible to produce daily evacuation and prevent marked distention of the bowel; however, because of the need for these daily enemas, the youngster could not actively participate in the usual social and athletic activities of his companions, and he became moody and presented a behavior problem. Roentgen examination of the large bowel revealed considerable spasm of the sigmoid colon, with pronounced dilatation of the descending and transverse portions of the colon. There was also considerable elevation of both leaves of the diaphragm. The right side of the colon, however, showed good peristaltic activity and haustral markings (fig. 10). On Oct. 26, 1949, laparotomy revealed a normal rectum, measuring 6 cm. in transverse diameter, but, starting at the rectosigmoid area and extending 14 to 15 cm. proximally, there was a narrowed segment of bowel, with a diameter of approximately 2 cm. The colon proximal to this was markedly dilated and hypertrophied. The haustral markings of the external surfaces were absent, being replaced with a continuous surface layer of opaque material. These changes in the bowel extended to the middle portion of the transverse colon, where the bowel wall, although somewhat thicker and more dilated than normal, had well-defined longitudinal muscle bands and haustrations. The transition from the abnormal to normal external surfaces of the bowel closely corresponded to the area where the haustral patterns and peristaltic activity appeared to be normal roentgenograhically. Balloons were placed in the transverse colon, the dilated sigmoid colon, and the narrowed rectosigmoid area. Although some small peristaltic waves were obtained, the interpretations of these tracings were difficult to evaluate. The colon from the junction of the proximal one-third and distal two-thirds of the transverse colon down to the rectal ampulla was resected, and an anastomosis between the transverse colon and the rectum was made, approximately 9 cm. from the anal skin margin. Postoperatively, the patient made good progress and was discharged on the 10th postoperative day, having two or three soft, well-formed stools spontaneously. He was followed in our outpatient department, and, on his last visit, one year after operation, he was having two stools of almost normal size and consistency a day. He had gained almost 20 lb. (9.1 kg.) and had grown 6 in. (15.24 cm.) and was no longer a behavior problem. Postoperative films, taken six months after surgery, revealed good contractility and evacuation powers of the residual segment of the colon (fig. 11).

CASE 4.—D. K., an 11-year-old white boy, was admitted to the University Hospitals on Jan. 3, 1950, and was discharged on Jan. 24, 1950. He had experienced marked constipation and abdominal distention since birth. He was first seen at the University Hospitals at the age of 3, when a diagnosis of congenital megacolon was made. He was placed on medical therapy, consisting of 200 mg. of methacholine bromide one-half hour after breakfast, mineral oil by mouth nightly, and mineral oil enemas as needed for relief from fecal and gaseous distention. With careful attention at home to details of this regimen, pronounced abdominal distention was prevented, and the child had daily evacuation. On several occasions, however, it was necessary to hospitalize him for episodes of acute intestinal obstruction, which were relieved by vigorous use of enemas. For almost a year prior to his last admission to the University Hospitals, management of the gaseous distention had become increasingly difficult. It was necessary for him to lie down once an hour, in order to expel the gas that distended his abdomen. Because of the increasing distention, his appetite was impaired. He was unable to attend school, and it was necessary to hospitalize him in his local community on several occasions for evacuation of his bowels. Physical examination on admission revealed a thin, pale, poorly developed boy, weighing 85 lb. (38.6 kg.) and measuring 53¾ in. (136.53 cm.) in height. He had marked flaring of the costal margins and great abdominal distention. Large loops of bowel could be easily seen beneath the distended anterior abdominal wall. After thorough cleansing of the bowel, a roentgenogram revealed an area of constriction at the rectosigmoid junction, with pronounced dilatation of the sigmoid and the descending and left side of the transverse colon. Proximal to this, the bowel was of smaller caliber and showed good, normal haustrations as well as active peristaltic waves. On Jan. 10, 1950, the patient was operated on; the dilated sigmoid and the descending and lateral, or distal, one-third of the transverse portions of the colon, along with the narrowed rectosigmoid, were excised. The rectosigmoid was 8 cm. long. The transverse colon was then brought down and anastomosed to the rectum, about 7 cm. from the anal margin. Postoperatively, the patient did well and began to have spontaneous semisolid stools on the fifth postoperative day. He was discharged on the 13th postoperative day, with the wound well healed and having soft but formed stools three times a day. About 10 days after his discharge from the hospital, he failed to pass any stool, and abdominal distention developed. He was examined with a proctoscope, and, although some narrowing was noted at the line of anastomosis, a no. 30 French rectal tube was passed without difficulty. He was admitted to the hospital for observation, and the rectal tube, which had been inserted during proctoscopy, was left inserted. The patient was given sitting up exercises to strengthen his abdominal muscles and instructed to go to the bathroom immediately after breakfast. He again started to have spontaneous bowel movements, and, after further observation for another week, during which he had almost normally formed stools daily, the patient was discharged. After his discharge, he made good progress, having spontaneous bowel movements of almost normal size daily, without further episodes of partial obstruction. Seven months after the operation, at a check-up, it was noted that he had gained approximately 10 lb. (4.5 kg.) and had grown 6 in. (15.24 cm.).

This patient had temporary but incomplete obstruction after surgery. The results of surgery can be classified as only good, in spite of the patient's weight gain and growth. This is the only patient in whom we anastomosed the left side of the transverse colon to the rectum; in the others, the colon was removed back to the right one-third or to the ascending colon. Although, in this patient haustral markings were present on the left side of the transvese colon, the transection of the bowel was probably made too close to the functionally inactive left side of the colon, and, consequently, the contractility of the distal portion of the residual colon was probably impaired. If this patient continues to have difficulty, we will resect the transverse colon and anastomose the ascending colon to the rectum.

CASE 5.—B. N., a 5-year-old white boy, was admitted to the University Hospitals on July 26, 1950, and was discharged on Aug. 29, 1950. He had a history of marked abdominal distention and failure to have spontaneous bowel movements, since birth. He needed daily enemas to produce bowel evacuation and to control abdominal distention. Examination revealed a well-developed, pale boy with a markedly protuberant abdomen. Peristaltic waves could be seen through the thin abdominal wall, and redundant loops of bowel filled with feces could be easily palpated. Roentgenograms of the colon showed pronounced distention of the sigmoid caused by gaseous and fecal retention. After adequate preperative preparation, the patient was operated on, on Aug. 15, 1950, at which time the colon distal to the junction of the right one-third and the left two-thirds of the transverse colon to the upper level of the rectum was removed. An anastomosis was then made between the transverse colon and the rectum, 8 cm. from the anal skin. The narrowed area of the rectosigmoid area measured approximately 6 cm. in length. Postoperatively, the patient made good progress and was discharged on the 14th postoperative day, having two to three well-formed, soft stools a day. At a postoperative visit, on Nov. 15, 1950, it was noted that he had grown 2½ in. (6.35 cm.) and had gained 3 lb. (1.3 kg.) since discharge from the hospital, three months previously. He was having between three and five semisolid stools spontaneously, daily. A barium enema, on Nov. 16, 1950, revealed good contractility and evacuation of the remaining portion of the colon and lower ileum (fig. 4 and 5).

COMMENT

The mortality rate associated with nonsurgical treatment of congenital megacolon has been high, ranging from 37 to 79%[20]; however, these mortality rates pertain to the pretransfusion and preantibiotic eras, and the death rate is undoubtedly lower now. Although medical therapy may be successful, it is rarely ideal, for it entails untold hardship on both the parents and the child. No one can blame a child or his parents for seeking relief from the disagreeable task of colonic lavage, even though daily fecal evacuations are thereby produced. The importance of the psychosomatic aspects of this disease cannot be overemphasized. Almost without exception, our patients presented personality and behavior problems. Their poor general health, the need for repeated enemas, and the fact they could not participate in activities on an equal basis with their playmates could readily be considered sufficient cause for personality aberrations. One of the most gratifying results of successful surgical treatment was the disappearance of personality and behavior problems.

In congenital megacolon, the weight of evidence indicates that there is a basic defect in the development of the myenteric plexus in the rectum, rectosigmoid, and sigmoid colon. This results, supposedly, in a functional obstruction, with secondary dilatation and hypertrophy of the bowel proximally; however, there are a number of points that prevent wholehearted acceptance of this theory. 1. The absence of ganglion cells of the myenteric plexus is not always seen in the "narrowed" rectosigmoid area.[21] 2. The ganglion cells may also be absent in variable portions of the dilated sigmoid. 3. The rectum, as visualized by a barium enema, appears normal in size, shape, distensibility, and contractility. 4. If the changes in the bowel proximal to the narrowed areas were secondary to the obstruction alone, one would expect the cecum, because it has the largest diameter of all portions of the colon, to have the maximum dilatation[22]; however, the maximum dilatation is in the sigmoid. Roentgenographically, peristaltic activity is readily seen in the right side of the colon, but the dilated sigmoid shows almost no peristaltic activity or contraction. These observations point to some as yet unknown defect involving the entire left side of the colon and sparing the right side of the large bowel. In support of this theory is the fact that the right side of the colon is presumably parasympathetically innervated by the vagus, whereas the left side of the colon is innervated via the pelvic parasympathetic outflow.

Because of the findings uniformly noted in roentgenograms, namely, a normal appearing rectum and a functional, active colon on the right side and a dilated, functionless colon on the left side, it was logical to resect the latter and anastomose the right side of the colon (ascending or right side of the transverse colon) to the rectum. The results in the patients so treated justify this concept. This procedure has the following advantages over the "pull-through" technique. 1. The resection of the colon and the anastomoses are done in the peritoneal cavity. There is then no need for going below into the perineum, pulling through the proximal colon, and doing an unusual type of anastomosis from below. 2. The rectum is almost entirely removed in the "pull-through" procedure. This may result in damage to the nervi erigentes. It is well known that after a combined abdominoperineal resection, with removal of the rectum, the majority of males are impotent. The surgical procedure advocated by Swenson does not entail so wide a removal of perirectal tissues as in the combined abdominoperineal resection for carcinoma, and the fear of sterility may be unfounded, but, in the young male, the pelvis is narrow, and, consequently, the pelvic parasympathetic nerves are more vulnerable. When the rectum is left undisturbed and when the mesentery of the removed segments is cut across near the bowel, damage to the sympathetic as well as to the parasympathetic nerve fibers to the pelvic viscera is obviated.

SUMMARY AND CONCLUSIONS

1. Physiological studies of the colon, as determined by fluoroscopic and roentgenographic examinations after the administration of a barium enema, in 15 patients with congenital megacolon, reveal: (*a*) a normal appearing rectum, (*b*) a "narrowed" segment of the rectosigmoid and sigmoid portions of the colon of variable extent, (*c*) marked dilatation and absence of peristaltic waves and normal haustral markings of the descending, sigmoid, and variable portions of the left side of the transverse colon, and (*d*) active peristalsis and normal haustral markings of the cecum and the ascending colon and right side of the transverse colon.

2. When the colon was exposed at laparotomy, the differences between the right and left side of the colon were marked and corresponded to the roentgenographic findings.

3. A one stage transabdominal operative procedure is described in which the narrowed terminal segment of the sigmoid and portions of the colon showing no peristaltic activity roentgenographically are removed. The residual part of the large bowel (ascending colon or right side of the transverse colon) is then anastomosed to the upper portions of the rectum, 6 to 10 cm. from the anal skin margin.

4. The operation described was performed on 15 patients, with no deaths. Fourteen patients were greatly benefited by the operation, but the other patient had to resort to enemas on several occasions since operation. The follow-up period of these patients ranges from six months to three years.

5. Saving the rectum is important, because it eliminates the question of damage to the nervi erigentes, which is a deterrent to the whole hearted acceptance of operative procedures in which the rectum is removed.

412 Delaware St.

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SELF-EXAMINATION OF THE BREASTS

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A half-century of application of radical surgery, radiation, and hormones in the attack on breast cancer has shown all too clearly that these methods of treatment can make only a limited gain in the control of the disease. The plain fact is that breast carcinoma is easily curable by good surgery when the primary lesion is small and the disease is limited to the breast. A 90% five year clinical cure rate is achieved with radical mastectomy in these cases. But when axillary metastases are present the cure rate is greatly diminished, and when distant metastases are present no cures at all are obtained. For the patients in this last category, improvement in surgical technique offers no hope whatever because the disease is far beyond the surgeon's reach. It has been recognized too late. The basic requisite for improvement in control of breast cancer is earlier diagnosis.

Can earlier diagnosis be achieved by better training of physicians? Only to a limited degree. Even if all physicians were ideally trained and able to detect breast carcinoma at its earliest palpable stage, the proportion of breast carcinomas discovered in this way would be relatively small, because only a small proportion of all adult women present themselves for physical examination often enough to assure the diagnosis of breast carcinoma at an early stage. In order to be reasonably certain of detecting breast carcinoma at an early stage the breasts must, in my opinion, be examined at least every two months. There are not enough physicians, enough time, or enough money to achieve this, even if women could be persuaded of the desirability of consulting physicians frequently for physical examination. Recent data collected by the American Institute of Public Opinion showed that only about one-third of the women questioned in a survey had consulted a physician within two months. In our own clinic 4.9% of breast carcinomas were discovered in patients who had no complaints referable to the breast but who were given a complete physical examination as a matter of routine.

If breast cancer is to be detected at an earlier stage in its development, it is the women themselves who must do it. This fact has led me to advocate the concept of self-examination of the breast. It is not a new concept. I first heard of it some years ago from the late Dr. Hugh Auchincloss. He had come to believe, as the result of a long experience in the Presbyterian Hospital with breast carcinoma, that women should be taught to examine their own breasts at regular intervals, and that they are often better able to feel breast tumors than an examining physician. I was at first hesitant to recommend self-examination, fearing that it would produce cancerphobia in susceptible patients, and being doubtful of the ability of women to feel their own tumors while they were yet small. My own experience has reassurred me on both counts, and I am today firmly convinced that teaching women to examine their own breasts is the best hope of improving our control of breast carcinoma.

My argument rests on the following facts. In our latest Presbyterian Hospital series of cases of carcinoma of the breast the mean diameter of the primary tumor in the breast was 4.8 cm. These are clinical measurements made at the time of the patient's admission. The series included 668 patients with primary breast carcinoma who came to the hospital between 1935 and 1942. Three hundred and five, or 61.6%, of the 495 patients upon whom radical mastectomy was done, were proved to have axillary metastases. But among the 173 who did not have radical mastectomy the disease was inoperable in 129, and it may be assumed that all of these 129 had regional or distant metastases. Thirty-one patients who were too feeble to withstand operation, and 10 others who did not have it for other reasons, are properly set aside in calculating the frequency of metastases. The total incidence of metastases in the series of primary cases was therefore approximately 70%. The absolute five year clinical cure rate in the series of 668 primary cases was 38.6% (the absolute 5 year clinical cure rate is arrived at by dividing the total number of primary cases, without deductions of any sort, by the number of patients who remain well after five years).

In contrast to these average patients with breast carcinoma it is instructive to consider a group with small early carcinomas. I selected the patients whose primary tumors had been carefully measured on admission and found to be 15 mm. or less in their greatest diameter. There were 28 patients in the group, 3 with 5 mm. tumors, 11 with 10 mm. tumors, and 14 with 15 mm. lesions. Radical mastectomy was done in all 28 patients, and only 3, or 10.7%, were proved to have axilliary metastases. The incidence of metastases in the average patients, whose tumors had a mean diameter of 4.8 cm., was therefore almost seven times as great as it was in the patients whose tumors had a mean diameter of only 1.5 cm. or less.

What this difference in the incidence of metastases means in terms of the chance of cure is obvious from the results in a series of cases of breast carcinoma in which a thoroughly radical type of mastectomy was done. The five year clinical cure rate for patients without axillary metastases was 90%, while it was only 41.3% for the patients proved to have axillary metastases. If, as the result of teaching women how to examine their own breasts, the proportion in whom carcinoma is discovered while it is yet early and small and before metastasis has occurred could be drastically changed, there might be hope for real progress toward the control of the disease.

TEACHING FILM

Two years ago, in cooperation with the National Cancer Institute of the U. S. Public Health Service and the American Cancer Society, a 16 mm. sound film in technicolor was made to test the feasibility of teaching women to examine their own breasts. Great care was taken in

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From the Institute of Cancer Research and the Department of Surgery, College of Physicians and Surgeons, Columbia University.

planning the film to avoid frightening the women who would see it. An attempt was made to demonstrate the technique physicians should use in examining the breasts, with proper emphasis on thoroughness and gentleness. Most physicians are too hasty and unsystematic in their examination of the breasts, and some are so heavy-handed that they distress their patients. A patient who has undergone such an experience is often unwilling to return for another examination. I have seen patients in whom palpation had been so rough that it produced ecchymosis! In the film the demonstration of how a physician should examine the breasts was followed by a portrayal of how he may teach his patient to examine her own breasts. Finally, an attempt was made to give the women seeing the film confidence that by means of careful and methodical self-examination they can be reasonably certain of discovering breast carcinoma, if they develop it, at an early enough stage to be cured.

The film has now been shown to audiences of women in various parts of the country for more than a year. Enough time has gone by to make some observations concerning its defects and merits, and to attempt to assess the value of the idea of self-examination of the breasts. It is already obvious that the film is popular with women. The demand for it on the part of women's clubs and organizations has been such that more than a thousand prints have had to be made of it. It is also popular among teachers of medicine, who are using it extensively in teaching medical students how to examine the breast.

An intensive and detailed study of the effectiveness of the film in teaching women to find their breast cancers earlier is being carried on in the state of Iowa under the direction of Dr. R. F. Kaiser of the National Cancer Institute of the U. S. Public Health Service, with service funds allocated for that purpose. A great majority of the adult women in the state are reported to have seen the film, and an effort will be made to measure the effects, if any, of this educational effort, in the years to come. Any statistical effect upon the control of breast cancer can scarcely be expected for a period of years, and ultimate evaluation of the effect of the film will be difficult.

I feel justified at this time, however, in presenting to physicians the idea of self-examination of the breasts, and a technique for teaching it to patients, so that physicians will be aware of the concept and ready to evaluate it. I also wish to offer some preliminary personal observations concerning the effects of the film upon women who have seen it.

TECHNIQUE FOR SELF-EXAMINATION OF THE BREAST

From an experience of some years in attempting to teach women a practical technique for examining their breasts, I came to use the method that has been presented in the film. The technique of self-examination is based, of course, on that which I have found preferable in my examination of the breast in my patients, a technique that I have described elsewhere.[1] The patient can not be expected to carry out all of the refinements of examination that a trained physician would employ, but she can be taught the essential features of an adequate examination of the breasts and how to use them relatively expertly.

Self-examination should be done when the woman is in negligee or night-clothes, as on retiring, so that there will be free access for inspection and palpation of the thorax and the breasts.

The first step in self-examination should be careful inspection of the breasts before a mirror. Women should be reassured about the inequality in the size of the breasts that many of them have, and which they may discover for the first time when they inspect their breasts carefully. They should be taught to look sharply, however, for asymmetry of the contours of the breasts and for dimpling of the skin. Since raising the arms sometimes brings out retraction signs, women should be taught to inspect their breasts first with their arms at their sides (fig. 1*A*), and then with their arms raised (fig. 1*B*). They should be taught that flattening and broadening of the nipple, as well as the nipple retraction of more advanced disease, are warning signs of cancer. They should, however, be reassured that simple inversion of the nipple, usually of many years' duration when it is observed in the middle-aged or older woman, is no reason for alarm. It should be emphasized that any erosion of the nipple surface, no matter how minute, or any spontaneous serous or bloody discharge from the nipple are signs of disease, requiring medical consultation. Other visible signs of breast disease, such as distortion of the areola and deviation of the axis of the nipple, are too difficult to see to be taught as a useful part of the self-examination routine.

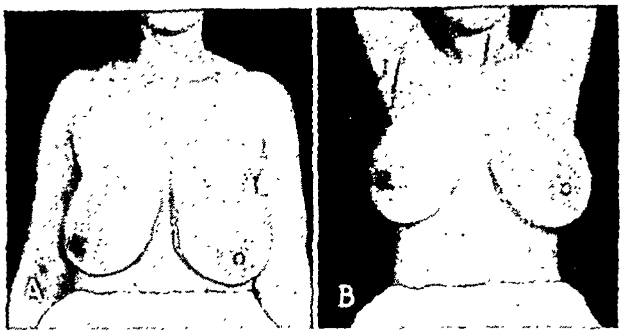

Fig. 1.—Inspection of breasts before a mirror. *A*, with the arms at the sides. *B*, with the arms raised.

The inspection part of the self-examination routine is not as important as palpation. Very few women notice the retraction signs that are all too evident with their breast carcinomas, but they usually feel the tumor. In self-examination, therefore, the emphasis should be upon palpation, which is the easiest discriminatory sense to educate.

The second step in self-examination should be to lie supine on a bed or couch. The arm on the side to be first examined should be raised above the head, and a small pillow, or if that is not available, a folded bath towel, placed under the shoulder (fig. 2*A*). This elevates the shoulder and shifts the breast somewhat medially, so that it is balanced and flattened out in as thin a layer as possible on the chest wall. If the shoulder is not elevated, the breast tends to fall laterally and fold upon itself, making palpation of the lateral half difficult (fig. 2*B*) because of its increased thickness.

The subject being in the proper position, palpation of the inner half of the breast is begun with the flat of the fingers of the opposite hand (fig. 3*A*). The palpation must be gentle, because tactile sensitivity is greatest with very gentle palpation. The whole extent of the inner half of the breast is explored, the examining hand tracing a series of transverse lines from the nipple line to the sternal edge, beginning just below the clavicle and descending to the inframammary fold (fig. 4*A*). The mammary tissue may reach the clavicle above and the sternum medially as a thin layer, and small carcinomas arising near the breast periphery may seem to be so superficial that they are often mistaken for harmless cutaneous lesions, even by examining physicians. A tumor anywhere in the breast area may be a carcinoma, and women should be taught to report it to a physician no matter how innocuous it may seem.

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[1] Haagensen, C. D.: Carcinoma of Breast, J. A. M. A. 138: 195-205 (Sept. 18) 1948; 138: 279-292 (Sept. 25) 1948.

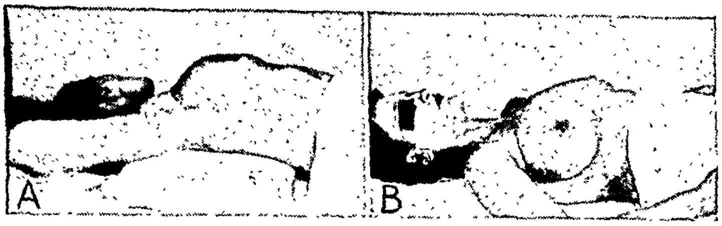

Fig. 2.—*A*, preferred position for self-examination of the breast, with a pillow under the shoulder so that the breast is balanced on the chest wall. *B*, Improper position for self-examination of the breast, with the shoulders flat on the table so that the breast falls laterally.

As a part of their instruction in self-examination women should be told of the existence of the inframammary ridge, and assured that it is not an indication of disease. The caudad edge of the breast is enfolded, and to a degree compressed, between the superficial and deep layers of the superficial fascia that tie it down to the thoracic wall. In younger or multiparous women in whom the breast tissue is more turgid the inframammary fold is not definable, but when in older women the breast becomes more flabby and atrophic, the inframammary ridge stands out as a denser, finely nodular ridge of tissue across its lower edge. Women often mistake this ridge for a tumor, and even some physicians are not aware that it is a normal structure. Neoplasms do, of course, sometimes develop within the inframammary ridge, and, when they do, diagnosis is difficult because the density of the ridge tends to mask them.

Having completed her palpation of the inner half of her breast, and of its lower edge, the woman is ready to examine the outer half of her breast. In this step it is preferable to have the arm down at the side, because the upper outer sector of the breast is more caudad in position, and therefore more accessible with the arm down (fig. 3*B*). The examining hand explores the whole extent of the outer half of the breast, tracing a series of transverse lines from the nipple line medially to the edge of the latissimus dorsi muscle laterally, beginning at the inframammary fold and ascending to the axilla (fig. 4*B*). The examination ends in the upper outer sector of the breast, which is the most difficult to examine because it is the thickest part of the breast. This sector, more often than any other part of the breast, shows nodularity that may be classified as within normal limits. It is also the sector in which dominant tumors representing disease are most often found. It is the sector of the breast, therefore, that should receive the greatest attention in any examination.

I believe that women should be discouraged from palpating their breasts while sitting up (fig. 5). If the breast is of average or larger than average size, palpation is more difficult in the erect position than in the supine position. In the erect position the lower dependent half of the breast is folded upon itself, and a small tumor may be masked by this increased thickness.

It is advisable for women to follow a definite technique such as has been described for self-examination, and to adhere to the routine of this technique. In this way they will become familiar with the physical characteristics of their breasts as revealed by repeated palpation with this one preferred method, and they will also be more likely to identify any small carcinoma that may develop in the breast.

In advising as to the frequency with which self-examination should be carried out, there is the dilemma of not wanting women to examine their breasts so often that they develop cancerphobia, but wanting them to carry out the examination often enough so that they have a reasonable chance of detecting carcinoma while it is yet in an early stage. My clinical experience with carcinoma of the breast has convinced me that the disease progresses more slowly than is generally thought. I believe that it takes at least from 6 to 12 months for a carcinoma to grow from a diameter of about 1 cm., at which it first becomes easily palpable, to 4.8 cm., the mean diameter of carcinomas in women coming for treatment today in this clinic. The aim with self-examination is, of course, to enable women to discover their breast tumors as soon as possible after they become palpable. I wish to push the moment at which tumor is discovered backward in time into the 6 to 12 month period that now elapses between the time a tumor becomes palpable and the time it is actually found. It has been suggested that monthly examination would be the safest way of achieving this aim. There is no doubt but that it would be preferable if it did not produce cancerphobia. I have been inclined, at least at the present stage of the effort to accustom the public to think of cancer in matter-of-fact terms, to advise that self-examination of the breast be carried out only at two month intervals. I tell my patients to do it on the even numbered months. In an effort to guard the patients whom I instruct in self-examination against cancerphobia, I appeal to them not to palpate their breasts at any other occasion than the bimonthly examination and not to think about breast cancer except on this one occasion.

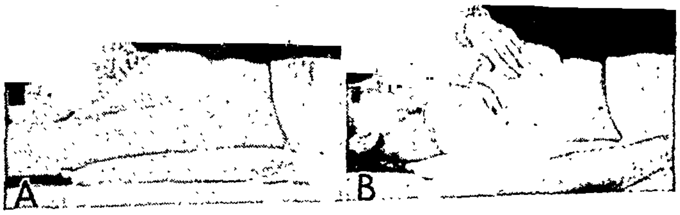

Fig. 3.—*A*, the position for self-examination of the inner half of the breast. *B*, the position for self-examination of the outer half of the breast.

For women who have not reached the menopause it is important to choose the correct phase of the menstrual cycle for self-examination of the breasts. In a considerable proportion of women there is enough vascular engorgement of the breasts in the premenstrual phase of the cycle to produce slight enlargement and increased turgidity of the breasts, and some tenderness. In a smaller number of women the engorgement is sufficiently pronounced to produce a degree of nodular thickening that may deceive the examiner into thinking actual tumors are present. It is desirable to carry out self-examination at the time when these transitory physiological changes are at a minimum, namely, in the immediate postmenstrual phase of the cycle.

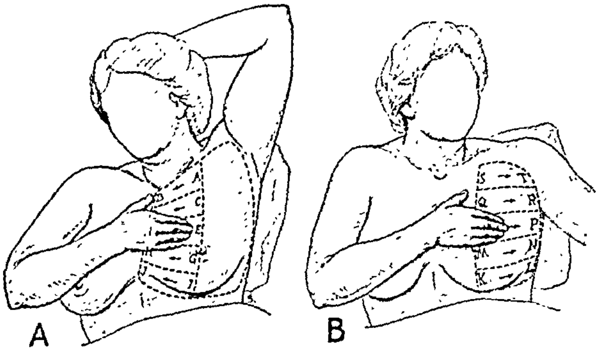

Fig. 4.—Positions of the hand for self-examination of the breast shown diagrammatically, *A*, for examination of the inner half. *B*, for examination of the outer half.

The question of what age is the right one to introduce the subject of self-examination is a debatable one. It is ridiculous to attempt to teach it to girls in their teens. It is doubtful that even young women in their final college years are mature enough for this discipline. It seems reasonable to begin instruction when women are in their early 30's. This is the age at which breast carcinoma first begins to have a considerable frequency, and it is the earliest age, in my opinion, at which women are willing to give thought and attention to such a serious subject as the detection of breast carcinoma. At this age they have founded their own families, and the responsibility of parenthood has sobered them and lengthened the shadow of fate before them.

EVALUATION OF SELF-EXAMINATION

Experienced clinicians know that the great majority of women who develop a breast tumor discover the lesion accidentally, usually while bathing or dressing. They happen to pass a hand over the portion of the breast containing the tumor and their attention is caught by the change in consistency or form. Neither folklore nor education have given the modern woman any idea of the possibility of purposeful self-examination of the breasts as a method of detecting cancer. The following case history illustrates this fact:

Mrs. X, a woman aged 42, while undressing happened to pass her hand over her right breast and discovered a lump in it. A paternal aunt had had breast carcinoma.

She came for examination the following day. There was a firm, poorly circumscribed tumor 3.5 cm. in diameter in the upper central portion of the breast. It was a carcinoma. Metastases were already present in the internal mammary lymph node chain. She eventually succumbed to the disease. She had discovered it too late.

This tragedy occurred despite the fact that the patient was the daughter of a physician and the wife of a physician, and as such had a better access than most women to medical knowledge. She had had a college education, and following her marriage had taken a prominent part in the Parent Teacher Association work in her community. Nowhere in these experiences had she learned that she could guard against breast cancer by examining her breasts herself.

In proposing to substitute purposeful search for accidental discovery of breast carcinoma, the first question to be asked is "Can women become sufficiently expert in self-examination of the breast to detect breast carcinoma at a reasonably early stage?" Experience has convinced me that they can. The best proof of this is the fact that women sometimes discover very small breast carcinomas by accidental palpation. I have seen a number of patients who have in this manner discovered breast carcinomas as small as 1 cm. in diameter. The following is such a case history.

Mrs. Y, aged 60, was active in civic affairs, and one day was given a bundle of brochures concerning cancer to distribute to the members of her club. She had had no special interest in cancer, and the task had been thrust on her as a duty that a public spirited woman ought to assume. As she lay in bed that evening thinking over the day's events, she recalled her promise to distribute the literature, and the fact that she had read none of it herself troubled her conscience. So she picked up one of the leaflets and read that a lump in the breast may be a sign of breast cancer. As she read, she instinctively put her right hand to the upper outer sector of her left breast. She was shocked to feel a very small firm lump. She slept badly and the next morning cancelled her plans for the day and consulted her internist. He confirmed her finding and sent her to me. Her tumor was hard, rather discrete, and measured 10 mm. in diameter. There was a suggestion of dimpling in the overlying skin. There were no palpable axillary lymph nodes. At operation frozen section confirmed the clinical diagnosis of carcinoma. Radical mastectomy was done. The axillary lymph nodes were not involved. All this was 10 years ago, and she is still well. It is fair to say that this woman saved her own life by finding her carcinoma at this early stage.

If it is possible for women to discover small early carcinomas by fleeting, casual palpation of this kind, it is certainly reasonable to expect them to discover them much more successfully after they have been taught to examine their breasts methodically with a correct and thorough technique. I know from my personal effort in teaching women to examine their own breasts that tumors, both benign and malignant, may, indeed, be found as a result of such teaching. Not all of the tumors thus discovered have been small, but some of those which proved to be malignant have been not only small but had not metastasized. The following is a case history.

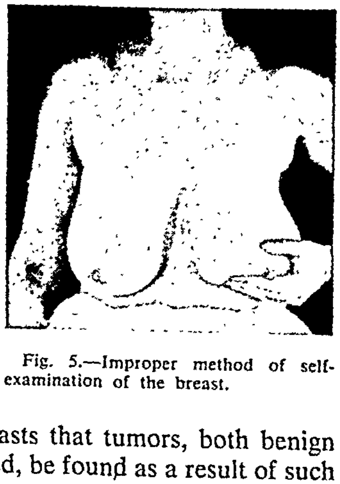

Fig. 5.—Improper method of self-examination of the breast.

Miss Z, a single woman aged 42, attended a showing of the film "Breast Self-Examination." That evening she examined her breasts according to the technique illustrated in the film, and found a tumor in the upper outer sector of the left breast. She came at once for consultation. The tumor was firm, poorly circumscribed, measured 2 cm. in diameter, and gave a definite retraction sign in the overlying skin on forward bending. Radical mastectomy was done. Fifty-four axillary lymph nodes were found, none of which contained metastases.

Experiences such as this have convinced me that women can become comparatively expert at palpating tumors in their own breasts. They have advantages that an examining physician can not possess. In the first place a woman palpating her own breasts is concerned with the findings in two breasts only. As she examines them repeatedly she becomes thoroughly familiar with their special characteristics. An examining physician has to attempt to recall the comparative findings in a great many breasts, a difficult feat no matter how detailed his written records may be. A woman examining her own breasts has a second important advantage: it is the proprioceptive tactile sense that helps her in palpating her own tissues.

To further emphasize that women may become expert at self-examination of their breasts, I must point out that in several instances women have come to me with small breast tumors which they had discovered but which I was unable to find in my first palpation. As a result of such experiences I have learned, in all humility, to ask patients in whom I have not found a tumor whether or not they feel one, and if they do to show me its location.

Teaching women to examine their own breasts will, beyond question, produce cancerphobia in some women and do them more harm than good. There are some women so unstable mentally that fear of cancer, often focused by family tragedy due to the disease, makes any rational consideration of it impossible. Some can not palpate their breasts at all without becoming terrified. Others palpate them daily and constantly torment themselves with thought of the disease. Physicians should therefore take care to teach self-examination only to those of their patients whom they know well enough to be certain that they will be able to think about the problem with the necessary degree of detachment. When the concept of breast self-examination is presented to women at large by means of the film, however, there can be no selection of subjects and some harm will certainly result.

In the last analysis the value of the concept of self-examination of the breasts will be determined only by teaching it widely over a long period of time and with the best modern educational techniques. Before this is done the idea should have the approval of physicians, for the public should and does look to physicians for judgment concerning a basic health concept of this kind. If physicians will but test out the concept by teaching self-examination of the breasts to their own patients, I am confident that they will eventually give the idea their approval. Some physicians will be tempted to condemn self-examination as a poor substitute for examination by a physician. They should face the fact that there are few women who can go to a physician for physical examination often enough to hope to have breast carcinoma discovered at an early and curable stage. To be reasonably safe a woman should be examined at least every two months. Self-examination is the only possible method of achieving this. It is a means of protection available to every woman, no matter how remote she may be from her physician. It costs nothing.

Physicians must also face the fact that the practice of self-examination will add to their difficulties in the diagnosis of lesions of the breast. When women examine their own breasts they find a remarkable variety of tumors and tumor-like formations. Most of these are the nodular thickening due to the physiological changes in the breast associated with the menstrual cycle. These are usually most prominent in the premenstrual phase of the cycle, but may persist over a considerable part of the cycle. Reexamination is often necessary to be certain that such nodularity is within physiological limits and that biopsy is not indicated. The examiner must, however, learn to recognize a tumor due to disease, and must understand that prompt surgical investigation of all such tumors in a hospital with all preparations made for a radical mastectomy is imperative. Pathology is the discipline that guides and educates the physician in making the decision as to what changes in the breast require surgical investigation. As women find tumors earlier and earlier with the popularization of self-examination, their recognition becomes an increasing challenge. Physicians must attempt to meet the challenge by giving more time and care to the examination of the breasts.

630 W. 168th St.

Carcinoma in Situ.—A carcinoma *in situ* is a neoplastic entity wherein the tumor cells still lie within the epithelium of origin. We accept the fact that they are cancer cells because, when they leave this site of origin and infiltrate or disseminate, their appearance is that of the cells still resident within the site of origin. This similarity is the only thing we have to identify them as cancer cells. Hence, in our present state of knowledge, they are cancer cells.

There is abundant evidence that these cancer cells may have remained within this site of origin for ten years or longer. This extensive period of relative quiescence, although most commonly recognized in the uterine cervix, is by no means thus restricted. It can be observed in in-situ malignant cervical lesions, laryngeal cancers, glandular cancers of the endometrium, lobular carcinomas of the breast, and perhaps other neoplasms. Chronology can be established only by fortunate accident in such cases. Thus, in a biopsy report of in-situ cancer of the larynx occurring many years ago the clinician doubted the report of carcinoma and did nothing. Infiltrating carcinoma first became apparent seven years later. . . . I do not wish to infer that this slow evolution is a feature of all cancer development; if such were the case, we would have no means of proving it. Rather I suspect it to be a feature of some examples of many types of cancer, and a feature common rather than rare. I do suggest that slow evolution is evidence of control.

Every cancer must begin as a cancer in situ—although this term is popularly applied to one anatomic type, cancer of the cervix. It may be equally applied to many mammary cancers, not alone the in-situ lobular carcinomas, but also the papillary cancers of ducts that fail to infiltrate. The term is suited to describe certain bronchus cancers, many early cancers in rectal polyps, some gastric cancers, some endometrial growths, and would have a much wider application if we only saw more early lesions.—Fred W. Stewart, Experiences in Spontaneous Regression of Neoplastic Disease in Man, *Texas Reports on Biology and Medicine,* Spring, 1952.

RETICULUM CELL SARCOMA

REPORT OF A THIRTEEN-YEAR SURVIVAL FOLLOWING ONE THOUSAND ROENTGENS OF X-RAY THERAPY

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and
Norman Lenson, M.D., Brookline, Mass.

Reticulum cell sarcoma is still a distinct problem from the standpoint of pathological classification and treatment. It is generally classified as a lymphosarcoma or as a malignant lymphoma. It is usually treated by external irradiation, although for apparently accessible local disease surgery has some advocates. Despite a dramatic initial response to irradiation in many cases, ultimate prognosis is poor and the usual life expectancy is between 6 and 24 months from the time of the diagnosis.[1]

The case reported here is one of a surgically inaccessible, highly malignant reticulum cell sarcoma, given only 1,000 r of external irradiation. Despite this limited treatment, the patient has for 13 years remained free of clinical recurrence, an extremely rare outcome for such a tumor.

REPORT OF A CASE

R. W., a 16-year-old white girl, was admitted to the Massachusetts Memorial Hospitals on June 10, 1938, with a swelling in her right supraclavicular fossa of about three months' duration.

Physical examination revealed an obese white girl with a somewhat nodular and firm fixed mass of tissue almost filling this space. Results of x-ray studies of the right clavicle, disclosed no abnormalities. Laboratory studies showed only mild leukocytosis and a slightly elevated blood sedimentation rate. The patient was discharged with a diagnosis of chronic lymphadenitis.

The mass continued to enlarge, rupturing centrally and exuding "watery material." In addition, numbness had developed in the fingers of the right hand. There was no weight loss or other significant complaints. The patient was readmitted to the hospital 10 weeks after her first admission. Her past history was essentially noncontributory. She had had the usual childhood diseases and for the past seven years had been taking two "pituitary" pills daily, apparently for obesity.

The family history was noncontributory. Physical examination on the second admission revealed that the mass in the right supraclavicular fossa was somewhat larger than previously and that it overlay the right clavicle. The mass was hard and fixed but presented centrally a flucuant area of 4 cm., which was not warm or tender but was draining thin fluid. The surrounding skin was thickened, red, and scaling. There were small hard nodes in the right axilla. No nodes were noted in the left axillary or cervical regions.

The hemoglobin was 11.5 gm. (74.5%), with a 4,150,000 red blood cell count. The leukocyte count was 10,600, with 88% polymorphonuclear leukocytes. The blood sedimentation rate was 18.5 mm. per hour. The results of serologic studies were negative. Total protein was 6.54 gm. per 100 cc., with 1:1 albumen-globulin ratio. The urine was normal. A culture from the sinus in the mass showed no growth.

Chest x-ray disclosed no abnormalities. X-ray of the right supraclavicular region revealed soft tissue swelling with a slight defect in the cortex along the upper border of the mid-third clavicle. This defect measured 7 by 1 mm. and was interpreted as possible tumor erosion. The preoperative impression was either cellulitis with abscess or neoplasm of the lymphoblastoma type.

On Sept. 8, 1938, with gas-oxygen-ether anesthesia, the brawny edematous skin overlying the right supraclavicular fossa was incised, permitting the escape of a small amount of thin, dark blood and revealing a 3 by 2 cm. cavity lined with friable, necrotic, translucent yellow-gray tissue. Several round resilient nodes about 1 cm. in diameter were palpable in the median supraclavicular area. The mass could not be excised, and only biopsy was done.

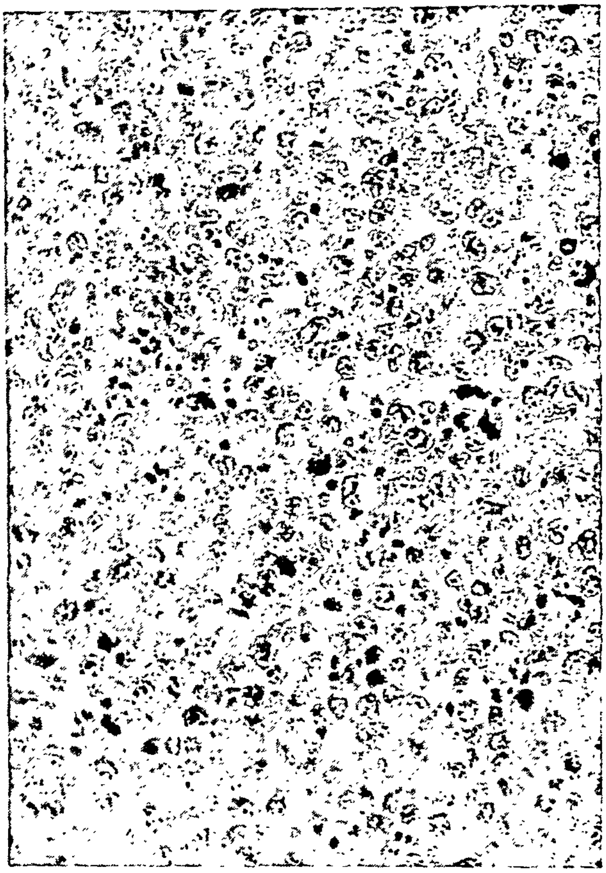

Fig. 1.—Reticulum cell sarcoma (patient R. W.). Note the extreme degree of mitosis and anaplasticity (low power).

The radiological study (fig. 1 and 2) revealed the specimen to consist of rapidly growing, extremely undifferentiated, irregular polygonal cells, showing tremendous anaplasia and large num-

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[1] (*a*) Hamann, A.: External Irradiation with Roentgen Rays and Radium in the Treatment of Human Leukemias, Lymphomas, and Allied Disorders of the Hemopoietic System, Radiology **50**: 378-385 (March) 1948. (*b*) Hellwig, A. C.: Malignant Lymphoma: Analysis of 202 Cases, Am. J. Clin. Path. **16**: 564-573 (Sept.) 1946. (*c*) Sugarbaker, E. D., and Craver, L. F.: Lymphosarcoma: Study of 196 Cases with Biopsy, J. A. M. A. **115**: 17 (July 6); 112 (July 13) 1940. (*d*) Jenkinson, E. L.; Kinzer, R. E., and Brown, W. H.: Lymphosarcoma, with Special Reference to Reticulum Cell Type, Am. J. Roentgenol. **48**: 433-438 (Oct.) 1942.

bers of mitotic figures. These tended to be irregularly rounded and showed a preponderance of nuclear material. The cytoplasm was extremely clear and vesicular in character, and the cells were supported by a small amount of rather highly vascularized stroma. There were extensive areas of necrosis throughout, infiltrated with products of acute inflammation. Because of the extremely rapidly growing nature of the tumor (with numerous mitosis), the pathologist believed that the tumor would be relatively radiosensitive. Radiation therapy was then administered through one supraclavicular port, measuring 10 by 15 cm., with 200 kv. at a target skin distance of 50 cm.

COMMENT

Although the initial response of reticulum cell sarcoma to radiation may be good, the ultimate prognosis is generally regarded as unfavorable.[2] Jenkins and co-workers[1d] reported a series of 8 cases of reticulum cell sarcoma with an average two-year survival following radiation therapy. Lenz and Portmann[3] have reported in detail their results observed two years after external irradiation therapy in 136 cases of lymphosarcoma, including reticulum cell sarcoma. In general, recurrence rates for the neoplasms in this series were inversely proportional to the dosage of x-ray, with only 20% recurrence after two years in patients given 2,000 to 3,000 r, but about 72% recurrence when only 1,000 r was administered. They found, furthermore, that reticulum cell sarcoma in particular was very prone to recur and most likely to do so if the dosages were under 2,000 r and the lesions more than 5 cm. in diameter, as in the case reported here. For such tumors they recommended at least 3,000 r and up to 5,000 r if tissues and treatment fields permitted. Age is also of prognostic importance. Stout,[4] reporting 89 cases of reticulum cell sarcoma from Presbyterian Hospital, found no instance of 10 year survival in patients under 30 years of age and only 12.1% of all patients with reticulum cell sarcoma survived for as long as five years.

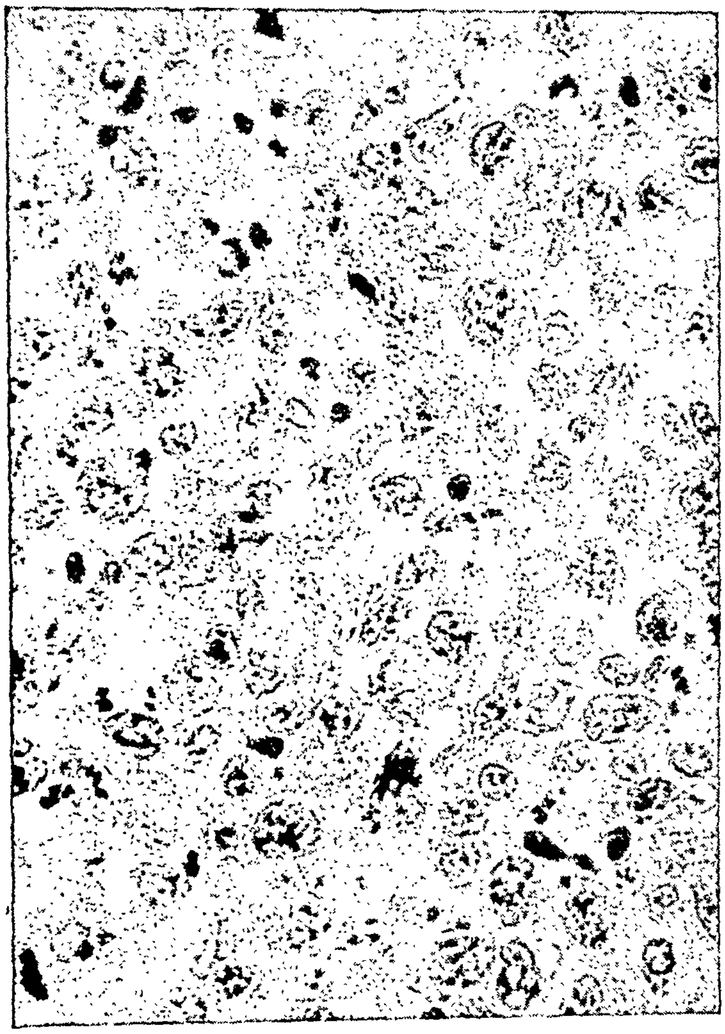

Fig. 2.—Reticulum cell sarcoma (patient R. W.). Note the cellularity and vesiculation of the nuclei (higher power than figure 1).

Autopsy statistics indicate that malignant lymphomas may be found in localized form in 10% of cases.[1b] It is for this small group with locally confined disease that surgical extirpation is the procedure of choice. The results are somewhat encouraging. Sugarbaker and Craver[1c] reported a 24% five-year survival for solitary reticulum cell sarcoma treated by surgical extirpation. Later follow-up for this series has not been reported to date. Hellwig's results parallel those of Sugarbaker and Craver. He reported a 24.6% five-year survival for surgically treated localized malignant lymphomas. His series included a single patient with reticulocytoma (highly undifferentiated reticulum cell) who was alive and well 20 years after surgery. Supplementary radiation therapy appeared to be without effect on ultimate survival in Hellwig's series of surgically treated patients.

SUMMARY

The reticulum cell sarcoma reported here occurred in a 16-year-old white girl. The tumor was of a highly malignant type and was inaccessible for surgical removal. At present, 13 years after irradiation treatment, the patient shows no evidence of recurrence of the tumor, although she received only 1,000 r of x-ray treatment. The experience of roentgenologists dealing with this problem suggests, however, that a much higher dosage should be employed.

1093 Beacon St. (46) (Dr. Lenson).

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2. Hellwig.[1b] Jenkins, Kinzer, and Brown.[1d]

3. Lenz, M.: Personal communication to the authors. Portmann, U. V.: Clinical Therapeutic Radiology, New York, Thos. Nelson & Sons, 1950, pp. 545-570.

4. Stout, A. P.: Is Lymphosarcoma Curable? J. A. M. A. **118**: 968-970 (March 21) 1942.

Blood Transfusion.—It behooves every physician who contemplates transfusing patients with blood to take certain precautions concerning the selection of both the blood and the patient. Every patient who is to be transfused should be carefully questioned for a history of previous transfusions or previous transfusion reactions. If the patient is a woman additional information regarding pregnancies and hemorrhagic disturbances should be obtained. It is generally agreed that husbands (or their immediate relatives) should not be used as donors for their wives unless an emergency exists and other donors are not available.

Avoidable human errors in the selection of blood probably account for a majority of incompatible transfusion reactions; consequently extreme care in the typing and cross-matching of blood is necessary. The routine employment of the indirect Coombs test would provide greater safety by the detection of unsuspected Rh antibodies in previously sensitized patients. It should be remembered that sensitization by one or more blood group antigens is possible whenever transfusions are given.—Charles H. McCroskey, M.D., and Stanley R. Friesen, M.D., Hemorrhagic Transfusion Reactions, *The Journal of the Kansas Medical Society*, March, 1952.

CLINICAL NOTES

WOLFF-PARKINSON-WHITE SYNDROME IN AN INFANT

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and
C. Jack Harrison, M.D., Chicago

The syndrome characterized by paroxysms of auricular tachycardia, fibrillation, or flutter in association with the electrocardiographic picture of a short P-R interval and a prolonged QRS interval as seen in healthy adults was described in 1930 by Wolff, Parkinson, and White.[1] The electrocardiographic findings had been noted first by Wilson [2] in 1915, who produced the characteristic abnormalities by varying types of vagal stimulation. Subsequently, many publications have described single or multiple examples of this interesting condition, but it was not until 1946 that the typical features of the syndrome were noted in an infant, aged 14 weeks.[3] In all, four infants have been reported as having the Wolff-Parkinson-White syndrome, aged 5 weeks,[4] 14 weeks (two cases),[5] and 4½ months.[6] In the infant on whom we are reporting paroxysmal tachycardia first developed at the age of 5 weeks, and the true nature of the condition was recognized 10 days later.

It is important for several reasons to recognize that this entity can occur in infants. First, it lends support to the thesis that the syndrome is not acquired but exists at birth and is due to the existence of unusual conduction pathways between the auricles and ventricles, permitting premature ventricular excitation; second, it calls attention to the need at all ages for differentiating the electrocardiographic findings encountered with the Wolff-Parkinson-White syndrome from bundle branch block due to acquired disease or septal defects; and finally, the paroxysmal arrhythmias may in infants, as seen in the case reported, give rise to serious congestive heart failure, although such a complication is stated to be rare in adults.[7]

REPORT OF A CASE

A male infant weighing 6 lb. (2,722 gm.) was delivered uneventfully at term on Feb. 13, 1951. It was stated that the mother had been well throughout this, her fifth, pregnancy. Examination of the infant at birth revealed no abnormality; he proceeded to gain weight satisfactorily on breast feeding and was discharged on Feb. 18, 1951. He was seen at the age of five weeks for a routine check-up, at which time an extremely rapid regular heart rate, estimated to be 300 beats per minute, was found. On reexamination three days later, the tachycardia had disappeared, and a regular rhythm, with a rate of 120 beats per minute, was present. During the next few days, the mother reported that on three occasions during feeding the baby became blue and seemed short of breath. Because of these symptoms, admission to the Presbyterian Hospital was advised.

Physical examination at the time of admission on March 31, 1951, showed a well-developed infant weighing 8 lb. 7 oz. (3,827 gm.) not in any respiratory distress. The rectal temperature was 98.8 F. His color appeared normal until he cried, when cyanosis of the forehead and circumoral region was seen. The neck veins were distended and pulsating, and the lungs were clear. By percussion, the heart was slightly enlarged, the rate was 290 and regular and was not modified by carotid sinus pressure; no murmurs or gallop could be detected. The liver edge was palpable three fingerbreadths below the right costal margin. The peripheral pulses were normal, and there was no edema.

The blood hemoglobin level was 10.8 gm. per 100 cc., the red blood cell count was 3,390,000 per cubic millimeter, and the white blood cell count was 4,300 per cubic millimeter. A urine specimen was normal. Fluoroscopy of the chest was considered to be within normal limits. An electrocardiogram taken on the day of admission (fig. 1) revealed a supraventricular tachycardia with a rate of 300.

The diagnosis of supraventricular tachycardia accompanied by congestive heart failure was made. Digifolin, 0.05 gm., was administered intramuscularly, and the infant was placed in an oxygen tent. Three hours later, the heart rate was 150, and, on the following day, it was noted that the neck veins were normal, auscultation of the heart revealed nothing remarkable, and the liver edge had receded to one fingerbreadth below the costal margin. No further tachycardia was observed, and cyanosis did not recur even during vigorous crying or at the time of feeding. Digifolin in doses of 0.025 gm. was administered on each of the next two days, and subsequently the infant was maintained on tincture of digitalis, two drops daily.

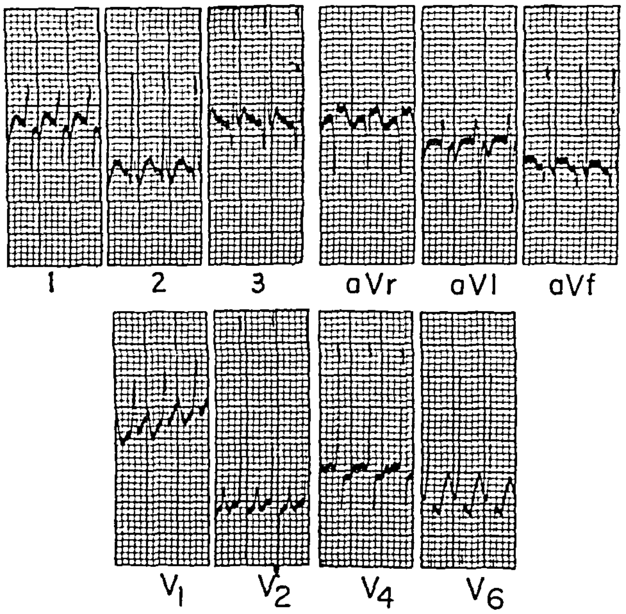

Fig. 1.—Electrocardiogram taken on the day of admission showing a supraventricular tachycardia at a rate of 300.

A repeat electrocardiogram taken on April 3, 1951, while the baby was crying lustily showed a sinus rhythm with a rate of 190, a P-R interval of 0.07 seconds with high peaked P waves, a QRS interval of 0.08 to 0.09 seconds, right axis deviation, and notable notching or slurring of the upstroke of the R waves in leads 1, 2, aVl, aVf, V_2, V_4, and V_6. The precordial leads were characterized by high R waves in all leads, no S wave being present in V_1. A tracing repeated on the following day (fig. 2) when the rate varied between 166 and 187 showed similar find-

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[1] Wolff, L.; Parkinson, J., and White, P. D.: Bundle Branch Block with Short P-R Interval in Healthy Young People Prone to Paroxysmal Tachycardia, Am. Heart J. **5**: 685 (Aug.) 1930.

[2] Wilson, F. N.: A Case in Which the Vagus Influenced the Form of the Ventricular Complex of the Electrocardiogram, Arch. Int. Med. **16**: 1008 (Dec.) 1915.

[3] Bodlander, J. W.: The Wolff-Parkinson-White Syndrome in Association with Congenital Heart Disease: Coarctation of the Aorta: Report of a Case, Am. Heart J. **31**: 785 (June) 1946.

[4] Schieve, J. F.: Paroxysmal Tachycardia in an Infant with Wolff-Parkinson-White Syndrome, Am. J. Dis. Child. **77**: 474 (April) 1949.

[5] Bodlander.[3] Kimball, J. L., and Burch, G.: The Prognosis of the Wolff-Parkinson-White Syndrome, Ann. Int. Med. **27**: 239 (Aug.) 1947.

[6] Richmond, J. B.; Moore, H. R., and Callen, I. R.: The Wolff-Parkinson-White Syndrome in an Infant, Pediatrics **1**: 635 (May) 1948.

[7] Wolff, L., and White, P. D.: Syndrome of Short P-R Interval with Abnormal QRS Complexes and Paroxysmal Tachycardia, Arch. Int. Med. **82**: 446 (Nov.) 1948.

cardiovascular disease. The remaining 13 showed either minimal or no evidence of cardiovascular disease clinically and electrocardiographically although 6 in this group were over 60 years of age.

The 23 patients with coronary atherosclerosis included 2 women. Their ages ranged from 35 to 78 years. All had unequivocal clinical and electrocardiographic evidence of recent myocardial infarction, and were studied from one to eight weeks after the acute episode. All except three patients in this group were receiving bishydroxycoumarin (dicumarol®) at the time of this study. All were on the regular hospital diet.

METHOD

The test consisted of a quantitative comparison by turbidimetry of the lipemia that follows the ingestion of a standard fat meal. After a 12 hour fast 10 cc. of venous blood were obtained from the subject. Immediately thereafter a fat meal was given. This consisted of a measured amount of cream containing approximately 20% fat (ordinary light cream), with an otherwise fat free breakfast, including a small glass of fruit juice, one slice of unbuttered toast, and a cup of coffee with sugar. Since the blood volumes of different persons are closely correlated to their surface areas,[5] the cream was given in the arbitrary amount of 100 cc. per square meter of the subject's body surface area using the Du Bois height-weight surface area formula.[6] No further food was allowed during the test period. Ten cc. of venous blood were then collected three hours and five hours after the test meal. The blood specimens were allowed to stand at room temperature for three hours, and were then centrifuged at approximately 2000 rpm for 20 minutes. The supernatant serum was pipetted off entirely free from all blood cells, fibrin, and platelet fragments. Hemolysis was carefully avoided. Turbidity readings of the serums were made in a photoelectric colorimeter using micro tubes. Distilled water was used as a blank, and a red filter (640 to 700 mμ) was used to minimize serum color or slight degrees of hemolysis. Grossly hemolyzed or icteric serums were not used in these determinations. We have expressed our results in terms of the direct scale readings[7] obtained in a Klett-Summerson photoelectric colorimeter.

TABLE 1.—*Serum Turbidity in Control Subjects Following a Standard Fat Meal*

Case No.	Age	Sex	Cream Ingested, Cc.	Turbidity Units				Description or Diagnosis of Controls
				Fasting	3 Hr.	5 Hr.	Total*	
1	19	F	188	28	120	55	88	Attendant
2	20	M	177	26	38	33	36	Spontaneous pneumothorax
3	21	F	172	26	74	70	72	Post cystitis
4	22	F	188	32	132	64	93	Attendant
5	22	F	187	29	68	32	50	Nurse
6	24	F	186	26	38	34	36	Nurse
7	25	F	187	32	72	70	71	Nurse
8	25	M	162	40	79	62	71	Post pneumonia
9	26	F	184	32	104	55	80	Attendant
10	31	M	197	30	55	50	53	Post pneumonia
11	38	M	175	31	67	51	59	Post pneumonia
12	40	M	185	30	185	52	119	Neurocirculatory asthenia
13	42	M	165	45	89	59	74	Post pneumonia
14	42	M	172	30	75	56	66	Post acute bronchitis
15	52	M	175	26	53	86	70	Quiescent pulmonary tuberculosis
16	54	M	195	25	62	118	90	Post osteomyelitis
17	58	M	180	28	54	90	72	Post rectal surgery
18	58	M	180	33	75	35	55	Post transurethral prostatectomy
19	61	F	198	30	52	90	71	Post pneumonia
20	64	M	195	40	63	73	68	Post cholecystitis
21	65	F	200	28	150	64	107	Post acute bronchitis
22	66	M	210	29	131	40	86	Post cellulitis
23	70	M	158	38	108	72	90	Emphysema
24	79	F	150	30	52	39	46	Post pneumonia
Average			182	31	83	60	72	

* Average of three and five hour postprandial serum turbidity readings of each subject.

RESULTS

The quantity of cream ingested in the test meal by subjects in the two groups was comparable. It varied from 150 to 210 cc., with an average of 182 cc. in the control group, and varied from 140 to 204 cc., with an average of 177 cc., in the group of patients with myocardial infarction (tables 1 and 2). There was no apparent correlation between the quantity of cream ingested and the resultant serum turbidity either in the control subjects or in the patients with myocardial infarction.

The serum turbidity readings of the fasting specimens were significantly higher in the patients with myocardial infarction than in the control subjects (probability less than 0.001), but there was considerable overlapping in the two groups. The Klett-Summerson readings varied from 25 to 45 units, with an average of 31 units in the control group, and varied from 30 to 52 units, with an average of 39 units in the group with myocardial infarction.

All subjects had a measurable increase in serum turbidity after the fat meal, but the increase was significantly greater both three and five hours after ingesting the fat meal in the myocardial infarction group than in the controls (probability less than 0.001). Serum turbidity was greater in the three hour than in the five hour specimens in all but 12 subjects, 5 of whom were control subjects and 7 of whom were in the group with myocardial infarction. All 12 persons with a delayed increase in serum turbidity were over 50 years of age.

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[5] Best, C. H., and Taylor, N. B.: The Physiological Basis of Medical Practice: A University of Toronto Text in Applied Physiology, Baltimore, Williams & Wilkins Company, 1945, p. 16.

[6] Du Bois, E. F.: Basal Metabolism in Health and Disease, ed. 3, Philadelphia, Lea & Febiger, 1936, p. 125.

[7] Optical density values may be obtained by multiplying the direct scale readings by 0.002.

In order to compare conveniently the postprandial serum turbidity levels, the serum turbidity readings of the three and five hour specimens of each subject were averaged, and the resulting value was designated as the person's postprandial total turbidity. In the control group total turbidity varied from 36 to 119 units, with an average of 72 units (table 3). Total turbidity was less than 100 units in all the control subjects except two, one man and one woman, aged 40 and 65 years, whose total turbidity values were 119 and 107 units, respectively (cases 12 and 21, table 1).

Total turbidity varied from 65 to 274 units, with an average of 149 units in the group with myocardial infarction. Total turbidity was more than 100 units in all but three patients in this group, all men, aged 45, 54, and 67, whose total turbidity values were 75, 74, and 65 units, respectively (cases 2, 8, and 15, table 2). They showed no apparent deviation clinically from the rest of the group.

TABLE 2.—*Serum Turbidity in Patients with Myocardial Infarction Following a Standard Fat Meal*

Case No.	Age	Sex	Cream Ingested, Cc.	Turbidity Units				Week of Convalescence
				Fasting	3 Hr.	5 Hr.	Total*	
1	35	M	204	43	375	146	261	3
2	45	M	172	30	86	63	75	1
3	46	M	170	60	138	90	114	3
4	48	M	160	37	123	115	119	6
5	49	M	170	42	315	233	274	2
6	50	M	180	35	220	85	153	3
7	52	M	193	50	90	114	102	3
8	54	M	204	32	68	79	74	3
9	54	M	190	42	246	144	195	4
10	54	M	202	38	125	81	103	3
11	56	M	184	52	229	190	210	4
12	60	M	176	35	115	150	133	3
13	62	M	175	40	278	70	174	2
14	62	M	174	41	158	132	145	2
15	67	M	165	30	96	33	65	3
16	67	M	174	36	167	108	138	4
17	68	M	172	39	192	78	135	4
18	70	M	175	45	266	244	255	4
19	70	M	174	40	230	250	240	4
20	73	M	184	34	145	57	101	1
21	76	F	177	44	90	195	143	4
22	78	F	140	31	89	145	117	8
23	78	M	165	36	96	115	106	6
		Average	177	39	171	127	149	

* Average of three and five hour postprandial serum turbidity readings of each subject.

COMMENT

Although the total number of patients tested in this study was small, there was a significantly greater increase in postprandial serum turbidity in the group with myocardial infarction than in the control group (probability less than 0.001). Significant differences between the two groups were noted at both the three and five hour levels. Because of the apparent delay in fat absorption in some of the subjects, these differences in postprandial serum turbidity values were best demonstrated by averaging serum turbidity values obtained three hours and five hours after ingestion of a standard fat meal.

An evaluation of the effect of other variables, such as age and sex, on the results cannot be adequately determined in the present limited study. However, the average postprandial total turbidity of the 12 control subjects who were 40 years old or less was 69 units, as compared to the average of 75 units of the 12 control subjects who were more than 40 years old. A similar comparison between the 10 women and 14 men in the control group revealed average postprandial total turbidity values of 71 and 72 units, respectively. These average values were all significantly lower than the average postprandial total turbidity obtained in the group with myocardial infarction.

Other variables, such as the administration of bishydroxycoumarin and the general effect of the recent acute illness on the patients with myocardial infarction, may have been factors that favored increased serum turbidity levels in this group. Further investigation is now in progress to determine the relative importance of such factors. However, all three patients with myocardial infarction whose postprandial total turbidity levels were below 100 units (cases 2, 8, and 15, table 2) were receiving bishydroxycoumarin when tested while the three patients who were not treated with bishydroxycoumarin (cases 4, 14, and 22, table 2) had moderately high levels of postprandial serum turbidity. In regard to the possible effect of the recent acute illness in increasing the serum turbidity levels, it was noted that the five patients who were tested during the first two weeks of their convalescence (cases 2, 5, 13, 14, and 20, table 2) had an average postprandial total turbidity of 154 units, while the 10 patients who were tested during the fourth week and later (cases 4, 9, 11, 16, 17, 18, 19, 21, 22, and 23, table 2) had an average postprandial total turbidity of 166 units. In this connection it should be kept in mind that there was no apparent increase in postprandial serum turbidity values in the control subjects who were convalescing from acute infection when they were tested (table 1).

TABLE 3.—*Serum Turbidity in Control Subjects and in Patients with Myocardial Infarction Following a Standard Fat Meal*

Group	Total	No. of Subjects with Total Turbidity *		Total Turbidity Units *		
		Less Than 100 Units	More Than 100 Units	Lowest	Highest	Average
Control subjects	24	22	2	36	119	72
Patients with myocardial infarction	23	3	20	65	274	149

* Average of three and five hour postprandial serum turbidity readings of each subject.

SUMMARY

A method of estimating fat tolerance on the basis of serum turbidity changes following the ingestion of a standard fat meal, as determined in a photoelectric colorimeter, is described. Study of control subjects and patients with myocardial infarction showed a considerably greater increase in postprandial serum turbidity in the group with myocardial infarction than in the control group. This finding suggests that the procedure may be a useful clinical method of evaluating the possible role of altered fat metabolism in the etiology of atherosclerosis.

8340 Fayette St. (Dr. Schwartz).

COUNCIL ON PHARMACY AND CHEMISTRY

REPORT TO THE COUNCIL

The Council has authorized publication of the following report from the Committee on Pesticides.

R. T. STORMONT, M.D., *Secretary.*

The following is the second in a series of general reports on select aspects of pesticides. It is prompted by the growing general concern over the efficacy and safety of electric vaporizing units for the dispersion of insecticides within buildings. Proponents of this method of insect control claim that it is superior to other available means because of its greater convenience, efficiency, and freedom from danger as compared with more conventional methods, such as hand spraying of insecticides. Others have felt that sustained exposure on a work-day or longer basis is intrinsically unsound because little is known about the effects of long-term exposure to low concentrations of insecticides in the atmosphere. While brief or occasional exposure appears to be harmless, it is not reasonable to expect that human beings can avoid injury if they are exposed for longer periods year after year to a toxic agent in atmospheric concentrations that kill insects in a few hours. It is further advanced that the resultant injury may be cumulative or delayed, or simulate a chronic disease of other origin, thereby making identification and statistical comparison difficult or impossible.

The danger of substituting other more toxic chemicals when insect resistance to presently used compounds occurs, the temptation to relax sanitary precautions, and the lack of adequate justification for use in the light of these factors are additional reasons for viewing with concern the expanding use of vaporizing devices in human environment. The following report, therefore, is intended as an evaluation of the available data. For information on the pharmacology and toxicology of the chemicals used in electric vaporizers for insecticides, the reader is referred to previous Committee reports on DDT (J. A. M. A. **145:**728 [March 10] 1951) *and lindane* (J. A. M. A. **147:**571 [Oct. 6] 1951).

BERNARD E. CONLEY, *Secretary,*
Committee on Pesticides

HEALTH HAZARDS OF ELECTRIC VAPORIZING DEVICES FOR INSECTICIDES

During the last war small smoke generators for insecticides were found by the military to be useful for the rapid destruction of mosquitoes. The convenience and simplicity of their use suggested peace-time applications for the disinfestation of rooms in homes and commercial establishments. Early trials of devices for these purposes were not too promising. While this method of control was more efficient than older means, such as fly-swatters and gummed paper, its use in kitchens caused complaints that food and water became tainted and unpalatable with the insecticides used. It was thought that these and other esthetic objections could be obviated by use of more refined mixtures of DDT (dichlorodiphenyltrichloroethane), benzene hexachloride, or their isomers. Eventually purer insecticidal chemicals and improved methods of formulation and application set aside the initial objections.

The technologic improvements in chemicals and methods of dispersal were not accompanied by parallel advances in knowledge of the physiologic actions of the insecticidal ingredients, particularly with respect to their chronic toxicity and inhalation hazards. As the use of thermal insecticide dispensers expanded, concern developed regarding the dangers of sustained exposure to vapors and particulate matter, especially where circumstances of use fostered an uneven distribution of insecticide. The apprehension was not without foundation since there was no published evidence to support the extravagant claims for safety in home and commercial use which accompanied the promotion of certain makes of the devices. Even now, specific facts are lacking on many aspects of usage of insecticides leading to chronic toxicity from inhalation exposure and food contamination. Nevertheless, independent studies conducted at academic centers and by various divisions of the Federal Security Agency and the United States Department of Agriculture have recently developed sufficient data to warrant conservative appraisal of the uses and limitation of these devices.

At the present time, several types of generators of insecticide vapors or fumes have been advertised or proposed for use here and abroad in homes, food establishments, industrial plants, hospitals, and schools. The commercially available devices include automatic, thermostatically controlled and manually controlled electric vaporizers which operate continuously, unless the source of heat, a light bulb or heating element, is turned off. Fumigating strips consisting of insecticide-impregnated wicks which are ignited in closed rooms have been proposed for use in food processing establishments in continental Europe. A fourth type of device, based on a somewhat different operating principle, is also undergoing development in this country. It consists of an insecticide-treated glass filter from which vapors are blown by means of an air current. Its proposed use and the end result of this device are basically the same as those connected with the preceding types.

Electrically operated thermal generators employ technical DDT, lindane, or a mixture of both in an inert base with a composition which may include substances such as glycols, carbowaxes, bentonite, or other clays. The insecticidal ingredients are placed in a cup of the generator and are slowly evaporated by a built-in heating element or some other heat source, such as an electric light bulb. The recommended rate of discharge for the automatic, thermostatically controlled apparatus is 1 gm. of insecticide in 15,000 cu. ft. for a 24 hour period. Greater concentrations may be expected with the more inadequately controlled, manually operated machines under comparable conditions.

The insecticidal ingredients are discharged as vapors or fumes which ultimately recrystallize on the ceiling, walls, and other exposed surfaces. The amount and surface distribution pattern of the recrystallized material varies with the insecticide or mixture of insecticides used and the ventilation characteristics in the rooms in which insect control is effected. Chamber tests indicate that the distribution pattern is extremely uneven with surface deposits of insecticide generally decreasing in density as distance from the generator increases. Much of the recrystallized material deposits on the ceiling and walls adjacent to the device, and it is possible for the material to accumulate to such an extent that loose crystals may become dislodged and fall to the floor or other horizontal surfaces below. This tendency is greatest with devices employing DDT.

The atmospheric dispersal of insecticide vapors or fumes is similarly irregular. The concentration of DDT in the atmosphere, except in the area immediately above the generating unit, is in the order of 0.13 to 1.3 mg. (0.009 to 0.09 ppm) per cu. m. of air when dispensed by a properly operating, thermostatically controlled machine. Lindane vapors from the same device have been found in concentrations ranging from 0.09 to 0.2 mg. (0.008 to 0.017 ppm) per cu. m. of air. If the average active person breathes approximately 10 cu. m. of air in an eight hour period, the maximum theoretical intake of insecticide may be approximately 1.3 to 13 mg. of DDT or 0.9 to 2 mg. of lindane during a normal work-day period. Correspondingly higher values could be expected when exposure to automatic devices is for longer periods or where inadequately controlled devices are employed. Use of the units in a space smaller than a room 40 x 40 x 10 ft., which roughly corresponds to the volume previously described, also predisposes to higher intake values.

The DDT level in the atmosphere approaches a concentration which might be considered to exceed a safe level for continuous exposure over a prolonged period of time. The lindane concentration is below the estimated safe level, although regular and continuous exposure is considered unwise. This atmospheric level of lindane coupled with its comparatively greater freedom from long-term toxic effects may have partially influenced the change from DDT which has occurred in the use of the automatic, thermostatically controlled type of insecticide generators. The principal reason behind this change, however, was the increasing incidence of insect resistance which is being encountered with the use of DDT. Resistance factors may have also contributed to selection of lindane as the impregnate in insecticide fumigating strips which in continental Europe are being proposed for home and commercial use. In this case, however, other considerations are also involved. While the rate of discharge is only slightly in excess of that used by the controlled temperature devices, the generating and dispersion processes are different. Food contamination from particulate matter dispensed by the glowing strip and the inhalation of possibly more toxic degradation products produced by the burning of the insecticide are items on which knowledge is lacking.

The health problems associated with the use of these devices have not gone unnoticed. Recently, the Interdepartmental Committee on Pest Control, which is composed of representatives of the Departments of Agriculture, Interior, and Defense and the Federal Security Agency, issued a statement on the health hazards of the automatic "vaporizer." The statement defined the conditions under which such devices employing DDT, BHC (benzene hexachloride), or mixtures of the two could be used with reasonable safety and cautioned against their use where available evidence suggested that dangers may exist. The Interdepartmental Committee's recommendations included use only where human exposure is on a normal working day basis, as in commercial establishments, and at a rate not to exceed 1 gm. to 15,000 cu. ft. for a 24 hour period. It recommended that units be installed above head level, 3 ft. or more below the ceiling, and removed from areas where condensation of the insecticide on walls, ceilings, nearby equipment, or fixtures could fall into, or otherwise contaminate, exposed food. It was also recommended that only devices be employed which have protective features, such as pilot lights to indicate periods of operation and fuses, to prevent excessive output, overloading, and excessive operating temperatures. The committee cautioned against continuous exposure to the devices and advised against their use in homes and sleeping quarters.

Since the issuance of this statement, the Committee on Pesticides has been advised of a number of reports of poisoning. A summary of the pertinent facts in several representative cases follows.

Generalized urticaria developed in a 35-year-old woman, in excellent health previously, one day after the installation of an automatic, thermostatically controlled vaporizing device at her place of employment. The device dispensed lindane and was hung 8 ft. above the floor and 12 ft. from where she performed her clerical duties.

Over weekends, while not in contact with the lindane vapors, her condition improved, but on returning to work, urticaria would recur. Two patch tests, 10 days apart, with the insecticide gave negative results, although removal of the device allowed the patient to return to work without recurrence of the symptoms. Two months later, while eating in a restaurant, she again experienced itching and smarting of the skin. On looking around she noticed a vaporizing device nearby. Other employees in the office, which was inadequately ventilated, reported "hives" and smarting of the eyes when the device was in operation.

A mild peripheral neuritis developed in a 50-year-old woman over a period of several months after she had been continuously exposed to manually controlled insecticide generators for over a year. The patient was a stable, intelligent person whose general health, except for occasional migraine attacks, had been excellent prior to the onset of the present condition. She resided in an eight room house in which continuously operating insecticide dispensers were installed in the bathroom and in the kitchen. The devices employed a mixture of 70% technical DDT and 30% lindane which was heated to a molten condition in the vaporizer cup by an electric light bulb. The report stated that the device used in the kitchen released sufficient insecticide or its degradation products (vaporized hydrochloric acid) to discolor the adjacent walls. It also stated that the patient frequently prepared food at and ate from a table situated close to the vaporizer and may have ingested significant amounts of the insecticide deposited on the table by the vaporizer.

A refreshment stand operator and his employee became ill after entering their place of business which contained a thermostatically controlled vaporizer. A strong, musty odor was noticed initially and shortly thereafter both persons experienced severe headache, nausea, and irritation of the eyes, nose, and throat. Symptoms disappeared two hours after the device was disconnected and the stand thoroughly aired. Examination of the dispenser, which was stated to have contained benzene hexachloride, disclosed a dark brown amorphous mass caked at the bottom of the vaporizer container. A strong musty odor permeated the room when a portion of the caked material was scraped off for laboratory analysis. Vaporization at higher than recommended rates coupled with the use of the technical mixture or an isomer of benzene hexachloride other than lindane, or a combination of those circumstances, were thought to be the causative factors in these cases.

A similar occurrence in another food dispensing establishment has also been reported. In this instance, a make-shift vaporizer which utilized an electric light bulb as a heat source caused symptoms of headache, nausea, and eye irritation in four employees shortly after installation. Symptoms, which subsided when the apparatus was turned off, were attributed to high concentrations of insecticide resulting from a poorly controlled heat source.

Other reports of irritation and illness have been brought to the attention of the Committee. Six industrial workers experienced headaches and mucous membrane irritations after exposure to the products dispensed by an overheated lindane vaporizer. Severe frontal headaches are said to be increasingly common among personnel servicing and adjusting the units at regular intervals. Several suspected instances of adverse reactions to home and office installed vaporizers have also been reported. Unfortunately, complete information is unavailable at the present time on the extent of injury and the circumstances of use.

Investigation has shown that, in many instances, acrid fumes are dispensed as the result of chemical alteration of the insecticide caused by foreign contaminants in the mixture or from the metallic container and because of faulty vaporizing devices which allowed excessive operating temperatures. Operation in poorly ventilated living or working areas and excessive exposure as the result of use in confined areas or through intimate contact during servicing are basic causes of complaint.

The allergic reactions described in the first case are not unexpected. Their probable incidence is relatively low, and would not in themselves militate against the restricted use of thermal aerosol insecticide generators. The systemic effects ascribed to exposure to certain types of these devices in the second case is a subject of more concern. In view of the general good health of the patient, the circumstances of her exposure, and the reported appearance of related syndromes in another person[1] as well as in animals exposed over a long time to chlorinated hydrocarbon insecticides, it is not unlikely that the patient's condition was occasioned, at least in part, by the ingredients discharged by the home vaporizer. The cause and effect relationship in conditions such as peripheral neuritis is sometimes hard to establish, although the evidence presented in the foregoing instance is so strongly suggestive that the burden of proof may well revert to those who would disclaim the insecticides and their manner of discharge as etiologic factors.

The foregoing cases reaffirm the warning against excessive exposure to electric vaporizers. The distribution and continued use of make-shift dispensers or those without mechanical features which protect against fire hazard, excessive vaporization, or the chemical alteration of the insecticidal ingredients because of high temperatures should be actively discouraged. Caution against the substitution of other chemicals for DDT, lindane, or their mixtures in thermal a[illegible]sol or vaporizing dispensers cannot be too strongly urged [illegible] if any of the devices which are currently in operation h[illegible] protective features previously enumerated, and many [illegible] provide for thermostatic control. The continued [illegible] such devices violates accepted health pr[illegible] [illegible]y should be supplanted by more accept[illegible]rol.

Federal regul[illegible] [illegible]ly the Insecticide Division, United [illegible] [illegible]riculture, have challenged the promo[illegible] [illegible]nsers in homes and small capacity area[illegible] [illegible]elves are not subject to registration [illegible] [illegible]he insecticides for use in them are so c[illegible] [illegible]gistered. At the present time, lindane [illegible] use in thermal

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1. Campbell, A. M. G.: DDT Poisoning in Man: Suspected Cases, Lancet 2: 1178 (Dec. 24) 1949.

generators cannot be registered under the provisions of the Federal Insecticide, Fungicide, and Rodenticide Act, unless the devices in which they will be used meet the safety specifications, other than the pilot light provision, of the Interdepartmental Committee's recommendations. This restraint is applicable only to the specified insecticides for use in thermal generators intended for interstate distribution. Vaporizers which are already in use or are not entered into interstate commerce are beyond the jurisdiction of the Federal Act. Several states and municipalities have recognized the urgency of this problem at the state and local level and are considering ordinances and other types of appropriate regulations. When such an approach is undertaken, the responsibility vested in local health officers should be kept in mind since they and their staffs are administratively in the best position to observe and correct practices contrary to public health and welfare.

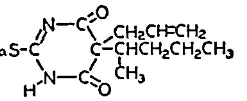
NEW AND NONOFFICIAL REMEDIES

The following additional article has been accepted as conforming to the rules of the Council on Pharmacy and Chemistry of the American Medical Association for admission to New and Nonofficial Remedies. A copy of the rules on which the Council bases its action will be sent on application.

R. T. Stormont, M.D., *Secretary.*

Thiamylal Sodium.—Surital Sodium (Parke, Davis).—$C_{12}H_{17}N_2NaO_2S$.—M.W. 276.34.—Sodium 5-allyl-5-(1-methylbutyl)-2-thiobarbiturate.—Thiamylal sodium is marketed as a mixture with sodium carbonate. The mixture is prepared by adding thiamylal and sodium carbonate to just enough sodium hydroxide solution to dissolve the salts. The pH is adjusted between 10.7 and 10.9. The solution is made up to volume with water, and is filtered, sterilized and lyophilized.

The structural formula of thiamylal sodium may be represented as follows:



Actions and Uses.—Thiamylal sodium is an ultra-short acting barbiturate and is particularly used for intravenous anesthesia in procedures of relatively short duration. Its anesthetic potency has been found to be about 1.4 to 1.5 times that of thiopental sodium so that smaller doses are required to produce an equivalent level of anesthesia. The cumulative effect of thiamylal sodium is reported to be less than that of thiopental sodium. Its action is rapid; anesthesia generally occurs within 20 to 60 seconds and recovery may be expected within 10 to 30 minutes after the last injection, depending upon the amount of the drug administered.

Thiamylal sodium is employed intravenously as the sole anesthetic agent in relatively short surgical procedures and as a supplement to local anesthetics during regional and spinal anesthesia or for induction prior to general anesthetics during prolonged procedures. It is compatible with the use of curare drugs employed to increase surgical relaxation. It is also administered rectally for diagnostic procedures in children.

Thiamylal sodium is detoxified by the liver and should not be employed in patients with hepatic dysfunction or disease. It should be employed with caution in the presence of respiratory disease or obstruction, anemia, obesity, severe disturbance of arterial tension, and cardiac failure. In short, this agent should be avoided whenever the intake or distribution of oxygen is impaired. It is contraindicated in traumatic shock or in conditions of impending shock.

Complications encountered are those of barbiturates in general, especially respiratory depression, hypoxia, laryngospasm, hypotension, and excitement. The drug should be employed only by anesthetists familiar with the signs of anesthesia peculiar to intravenous barbiturates and the precautions in the use of these agents.

Dosage.—Intravenously, an initial injection of 3 to 6 cc. of a freshly prepared 2.5% solution is sufficient to produce short periods of anesthesia. The rate of injection during induction should be 1 cc. every five seconds, and, as indicated, additional injections of 0.5 to 1.0 cc. are made intermittently with the needle remaining in the vein. The maximum total dose should not exceed 1 gm. (40 cc. of a 2.5% solution). As a supplement to other forms of anesthesia, the drug may be administered by continuous intravenous drip as either 0.2 or 0.3% solution. When preliminary medication has been given, induction should be delayed 30 to 45 minutes to permit this to attain its full effect.

Rectally, for diagnostic procedures in children, a 5% solution is used, the dosage being based upon 0.8 to 1.0 gm. per 50 lb. (22.7 kg.) of body weight.

Tests and Standards.—

The acid, thiamylal, used in the preparation of thiamylal sodium responds to the following tests and standards.

Physical Properties: Thiamylal is a light yellow to white, lumpy powder with an aromatic odor and a slightly bitter taste. It melts between 130 and 134°. One gram of thiamylal is soluble in about 4.0 ml. of alcohol, 87 ml. of benzene, 4.6 ml. of chloroform and 3.3 ml. of ether. It is soluble in solutions of alkali hydroxides and practically insoluble in water. The pH of the saturated aqueous solution is about 5.4.

Identity Tests: Heat about 0.2 gm. of thiamylal in a test tube with about 0.2 gm. of anhydrous sodium carbonate: a strip of moistened red litmus paper held in the mouth of the test tube turns blue *(presence of nitrogen).*

Dissolve about 20 mg. of thiamylal in 0.3 ml. of sodium hydroxide T.S., heat just to boiling, and add 2 ml. of water and 2 drops of sodium nitroprusside T.S.: a red color develops *(test for substituted thiobarbituric acids and distinction from thiobarbituric acid and barbituric acids).*

Shake about 0.1 gm. of thiamylal with 5 ml. of carbon tetrachloride for 1 min. in a 10 ml. glass-stoppered cylinder and filter the mixture. To the filtrate add 0.25 ml. of 5% bromine in carbon tetrachloride and shake vigorously: the bromine color disappears rapidly *(presence of unsaturated side chain).*

Purity Tests: Dry about 1 gm. of thiamylal, accurately weighed, for 4 hours at 80°: the loss in weight is not more than 0.3%.

Ignite about 1 gm. of thiamylal, accurately weighed: the residue is not more than 0.05%.

Assay: (Thiamylal) Dissolve about 0.5 gm. of thiamylal, accurately weighed, in 25 ml. of previously neutralized alcohol. Dilute with an equal volume of water previously boiled to remove carbon dioxide and titrate with 0.1 *N* sodium hydroxide using thymolphthalein T.S. as an indicator. Each milliliter of 0.1 *N* sodium hydroxide is equivalent to 0.02544 gm. of thiamylal. The amount of thiamylal present is not less than 98.5 nor more than 101.5%.

Dosage Forms of Thiamylal Sodium

Powder. *Physical Properties:* Thiamylal sodium (in admixture with sodium carbonate) consists of pale yellow, hygroscopic, agglutinated masses of crystals with no pronounced odor. It is freely soluble in water. The pH of a 2.5% solution is about 10.8.

Identity Tests: Place about 25 mg. of thiamylal sodium in a 100 ml. beaker and dissolve it in 25 ml. of water. Stir the solution while adding diluted hydrochloric acid until the thiamylal is precipitated completely. Allow the beaker to stand for 15 min. Filter the mixture, wash the residue with several small portions of water, press the filter paper between the folds of a clean towel, transfer the residue to a watch glass and dry it at 60° for one hour. The thiamylal obtained melts between 130 and 134°, and responds to the identity tests described in the monograph for Thiamylal Sodium.

Purity Tests: Prepare a 2% solution of thiamylal: it is bright yellow and free of haze, floaters, and other foreign particles.

Dry about 1 gm. of thiamylal sodium, accurately weighed, for 18 hours in a vacuum at 56°: the loss in weight is not more than 1.0%.

Assay: (Thiamylal Sodium) Dissolve about 1 gm. of thiamylal sodium, accurately weighed, in about 60 ml. of water in a 100 ml. volumetric flask. Shake well to effect solution and dilute to the mark with water. Transfer to a 125 ml. separatory funnel a volume of solution, accurately measured, equivalent to about 0.25 gm. of thiamylal sodium. Acidify with 5 ml. of diluted hydrochloric acid while swirling the mixture. Extract the liberated thiamylal with five 20 ml. portions of chloroform and filter each portion through a pledget of cotton. Rinse the cotton with two 10 ml. portions of chloroform. Evaporate the combined chloroform extracts and washings under a current of warm air (but not over steam) to a volume of about 5 ml. Remove the rest of the chloroform on a steam bath while swirling the contents of the beaker. Dry the residue at 60° for one hour and weigh it. Each gram of thiamylal obtained is equivalent to 1.086 gm. of thiamylal sodium. The amount of thiamylal sodium present is not less than 94.0 nor more than 96.0%.

Powder Surital Sodium: 1 gm. Steri-Vials packaged with or without diluent. U. S. Patents 2,153,712 and 2,153,729. U. S. Trademark 500,405. Parke, Davis & Company, Detroit.

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VOLUNTARY PENSIONS FOR PHYSICIANS

Elsewhere in this issue (page 391) is an analysis of the Keogh-Reed bills (H. R. 4371 and H. R. 4373), which would encourage by tax deferment a voluntary pension system. This article is an abstract of the testimony given on May 13, 1952, in Washington at the hearings of the House Committee on Ways and Means by Frank G. Dickinson, Ph.D., for the American Medical Association. Similar encouragement is now given to employed persons under Section 165 and related sections of the Federal Internal Revenue Code. An editorial on this subject appeared in THE JOURNAL recently,[1] but it did not present an analysis of what might reasonably be expected under the terms of the bill in the matter of pensions. The current article provides that analysis for the benefit of physicians, professional persons generally, and those interested in the pension plight of the self-employed.

On the basis of recent surveys by the United States Department of Commerce of the incomes of physicians, lawyers, and dentists, it has been estimated that the average monthly pension starting at age 70 that could be reasonably expected under this bill would be $208 for physicians, $146 for lawyers, and $140 for dentists. If the proposed past-service credits feature were adopted by the Congress the average expected pension starting at age 75—not age 70—for those now aged 56 would be $131 per month for physicians, $121 for lawyers, and $72 for dentists. The tax savings resulting from deferring the taxes to the low income retired years would probably not average more than one-fifth of these annuities.

As a result of his analysis, the Director of the Bureau of Medical Economic Research expresses the view that the loss in revenues to the Treasury Department will be moderate. They will be small in comparison with the amounts now being excluded by employers for the financing of approved pension plans for their employees. He also points out to those who labeled this bill a "rich man's" bill that under employer pension systems the amounts contributed by the employer are greater for the higher paid employees than for the lower paid employees. Most persons are well past 40 years of age and approaching the peak earning period of their lives before they think seriously about setting aside some of their income for retirement purposes. This greater prospective use of the bill by older professional persons is a phenomenon of age rather than of higher income. For persons in the same age group Dickinson expresses the view that the propensity of the professional man and his wife to save for old age will probably be the major factor in determining their decision to exclude from current taxable income the maximum percentage of their earned income permitted under this bill. For these reasons it is apparent that the charge of critics that this is a "rich man's" bill are not well founded.

LIPOGENESIS

Both the livestock industry and the medical profession have a real interest in the transformation of nonfat food materials into body fat in the organism. The various factors involved in this fundamental biochemical change have received more or less continuous attention over the years. Endocrine dysfunction has long been known to influence the deposition of fat, and the chemical makeup of food fats is known to condition, to a considerable extent, the character of depot lipids.[1]

It is only within comparatively recent years, however, that more precise knowledge regarding the mechanism of the biosynthesis of body fat has been secured. Employing acetic acid with isotopic carbon and hydrogen, Rittenberg and Block[2] showed that this two-carbon compound was used by the organism in the formation of the long-chain fatty acids that are typically found in animal fats. More recently, further light has been thrown on this phenomenon[3]; laboratory rats were given isotopically labeled (C^{14}) myristic acid, and the saturated and unsaturated fatty acids of the carcass fat were examined and identified. The distribution of radioactive carbon indicated that the myristic acid that had been fed was utilized for the synthesis of palmitic acid, a higher homologue that is one of the characteristic fatty acids of animal fat. The studies showed that carbon atoms 3 to 16 came from the myristic acid, whereas carbons 1 and 2 were provided by acetic acid. There was evidence, too, that part of the isolated palmitic acid arose from two-carbon units (acetic acid) in the course of the biosynthesis.

Further light on the influence of hormones on lipid synthesis has recently been shed through in vitro experiments. It has been known that liver slices of normal animals will synthesize fatty acids when incubated in a nutrient medium containing acetate, whereas liver slices from animals subjected to pancreatectomy have largely lost this capacity. These observations have been extended[4] to include other hormones. Whereas pancreatectomy alone inhibits the formation of fat by the liver slices of the experimental animal, simultaneous hypophysectomy is followed by normal lipogenesis, as shown by the incorporation of C^{14} from the labeled acetate into the fatty acids of body fat. Purified anterior pituitary growth hormone injected into animals subjected to hypophysectomy and pancreatectomy resulted in a profound inhibition of lipogenesis by the liver, and cortisone administered to intact animals has the same effect. In normal animals, injected insulin favored in vitro lipogenesis, by liver tissue, whereas growth hormone and cortisone depressed the synthesis of fat.

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[1] J. A. M. A. **148**: 1279 (April 12) 1952.

[1] Anderson, W. E., and Williams, H. H.: Rôle of Fat in Diet, Physiol. Rev. **17**: 335, 1937.

[2] Rittenberg, D., and Block, K.: Utilization of Acetic Acid for Fatty Acid Synthesis, J. Biol. Chem. **154**: 311, 1944.

[3] Anker, H. S.: On the Mechanism of Fatty Acid Synthesis in Vivo, J. Biol. Chem. **194**: 177, 1952.

[4] Brady, R. O.; Lukens, F. D. W., and Gurin, S.: Synthesis of Radioactive Fatty Acids in Vitro and Its Hormonal Control, J. Biol. Chem. **193**: 459, 1951.

The foregoing observations emphasize anew the enormous significance of metabolites of simple constitution (like acetate) in biologic synthetic activity. And the refinement of the knowledge of the details of hormone intervention in metabolism should ultimately be of practical value to the internist.

THE DURHAM-HUMPHREY AMENDMENT

The Durham-Humphrey amendment to the Federal Food, Drug, and Cosmetic Act became effective on April 26 of this year. This amendment to the law contains a specific requirement relating to the labeling of drugs that move in interstate commerce as well as provisions that affect prescription practice.

Drugs that cannot be used with relative safety in self-medication must bear the legend "Caution: Federal law prohibits dispensing without prescription" on their labels. The pharmacist is liable to prosecution if he makes an over-the-counter sale of any such drug to a customer without obtaining a bona fide prescription or oral authorization from a licensed practitioner. Moreover, the pharmacist who refills prescriptions for such drugs without the authorization of the prescribing physician is violating the law. The Durham-Humphrey amendment also provides that prescriptions for drugs that can be sold legally over the counter may be refilled by the pharmacist at his own discretion.

Undoubtedly many physicians now receive a considerably increased number of telephone calls from pharmacists requesting necessary authorization to refill prescriptions for those drugs that cannot be legally sold over the counter. The medical profession has no cause to complain in this regard. It is the duty as well as the prerogative of the physician to determine whether the refilling of a prescription is in the best interests of his patient. Physicians can frequently obviate needless waste of their own time as well as that of the pharmacist and the patient by indicating their specific desire with respect to refilling when they write in the orginal prescription.

INSECTICIDE VAPORIZERS—HELP OR HAZARD?

The use of electrical devices for the intermittent or continuous dispersion of insecticides into the atmosphere of commercial establishments and homes has become popular in the last few years because of the convenience and simplicity of these devices in the control of flying insects. Developmental data obtained under controlled conditions with certain of the machines indicated that amounts of poison were dispensed that neither deposited in significant quantities on exposed surfaces nor accumulated in the atmosphere of properly ventilated areas sufficiently to cause injury to humans exposed for ordinary working periods.

It was found under practical conditions of use, however, that the laboratory standards for safe and effective performances were not being duplicated in practice. Poor construction and installation of units, tampering to effect greater control, overheating that resulted in excessive output, substitution of chemicals and formulas other than those recommended, installation in homes where overexposure of young children was likely, and a variety of other abuses have occurred. These are fostered in part by exaggerated claims for efficiency and harmlessness and in part by a growing tendency of users to increase the output of the machines in order to control resistant strains of insects. While technically constituting misuse, such situations are measures of the common method of use that may be expected to continue with the great majority of devices presently employed.

Concerted effort to control these particular abuses has been undertaken to solve the more urgent problems associated with the growing use of insecticide vaporizers. Of equal if not of greater importance are those difficulties that may arise from long-term or repeated subclinical exposure. It is for these reasons that a report of the Committee on Pesticides on this subject appears elsewhere in this issue of The Journal.

EDUCATION BY PRESSURE GROUPS

The concept of healthful living held by small pressure groups has influenced the curriculum of the public schools ever since personal and community health were first considered suitable material for our children to study. These pressure groups learned early that if they could "get a law" they could dictate what would be taught or the manner of its teaching, regardless of the validity of the facts or hypotheses involved.

A new interference with the free teaching of the facts and accepted hypotheses relating to personal and community health has recently been enacted into law by several states and may be considered by others. In New York the 1950 Legislature amended section 3204, chapter 135, of the statutes by adding subdivision 5, which reads: "Subject to the rules and regulations of the Board of Regents, a pupil may be excused from such study of health and hygiene as conflicts with the religion of his parents or guardian. Such conflict must be certified by a proper representative of their religion as defined by section two of the religious corporations law." The State Commissioner of Education has approved the exemption of the children of a certain religious faith from instruction in the units of disease prevention and control.

These children will get no instruction in such areas as the building of resistance to disease; the understanding of current health problems, both public and private; measures used to prevent the spread of communicable diseases, the importance of heart disease, cancer, diabetes, diphtheria, typhoid, tuberculosis, and poliomyelitis; the role of insects in the transmission of disease; the relation of sanitary control of water and food to public health; war conditions and the problem of disease control and prevention; what bacteria are; the home care of the sick; first aid treatment; and much else.

In addition to excusing certain children from attending classes while "undesirable" information is being taught to their colleagues, the Commissioner directs that "required sections of the Regents Examination as well as the State Scholarship Examinations will be so constructed so as not to penalize pupils who have been excused from instruction in the specified units of study." Thus, deemphasis and virtual elimination of these topics looms for all children because they are not acceptable to a few children, and the gains of a half century in health education will be lost.

The California Education Code 1949, section 10302, prescribes the course of study including training for healthful living—"provided, however, that whenever any part of the 'training for healthful living' conflicts with the religious beliefs of the parent or guardian of any pupil, then on written request of the parent or guardian the pupil may be excused from the part of the training which conflicts with such religious beliefs." Similar provisions exist in other states.

The attainment of a high level of scholarship in the sciences is the privilege of those capable of such attainment. Those who are capable but choose to waive their privilege by being absent from classes in health and hygiene have every right to select studies more to their liking; however, those who wish to shun these subjects have no right to create situations that prevent those who wish to study them from exercising the privilege which is theirs. The Regents Examinations of New York, and similar tests of ability in other states, should include questions in health, hygiene, and healthful living that everyone should be expected to answer. The inability of certain persons to answer is a deficiency of their own choosing. A knowledge of healthful living is part of the working information of every educated man. No person should be deprived of the opportunity for a well-rounded education because some persons wish to restrict their learning without accepting the inevitable consequences. No person should be deprived of the privilege of being examined on all of the subjects he has studied, so that he may have a true evaluation of the level of scholarship he has attained.

Religious beliefs must be respected. We can defend a person's right to hold an opinion contrary to the opinion of the majority and the demonstrable facts of biological science. We can defend a person's right to contract and suffer unnecessary illness resulting from his intentional ignorance of accepted disease control practices, if he so elects; we cannot, however, defend a person who spreads his illness to others through ignorance or forces his ignorance of disease prevention techniques on others through legislation or administrative order. To deprive children of an understanding of these basic facts of community living, whether they wish to believe them or not, will soon develop an uninformed and unprotected public unable to defend itself from epidemic and endemic disease.

The future health of our citizens, and our preservation in time of war, depend in part on public understanding of the disease control measures practiced by our physicians and health departments. Physicians, more than any other persons, know the importance of teaching the basic facts of life and living, bacteriology, disease control, sanitation, and human biology in the public schools. They should advise their legislators on the validity of the proposed changes in what is to be taught our children about health protection. Only in this way can we be sure the advances in community health protection will continue. Individual parents may elect to keep their children ignorant of the facts of life and living, but no one, legislator or administrator, has the right to deny this knowledge to the children of others. Our schools must continue to teach scientific fact, and physicians, as informed citizens, bear a responsibility for continued sound health education.

FERTILIZATION OF TRANSFERRED OVA

An interesting approach to the problem of sterility is presented by Noyes,[1] who recently reported the successful transfer, fertilization, and growth to normal young of ova removed from ovarian follicles of donor rats and transferred into the ovarian bursas of recipients. Maturing ovarian follicles of black donor female rats were pierced under saline solution and their contents expressed. Each cumulus with its ovum was dissected free from the surrounding mural granulosa. Some of the ova were used for histological purposes; the remainder were counted, picked up with a capillary pipet, and transferred to the ovarian bursa of a previously mated albino female. The recipient mother was then permitted to go to term, at which time the young were counted. Fetuses developing from the transferred ova could be distinguished by their eyes, which were darker than those of the fetuses ovulated by the recipient. Their development and vigor appeared entirely normal.

A correlation between histological examination and transfer experiments indicated that follicular ova transferred before the onset of maturation division did not develop into young when transferred to the inseminated recipients and that more ova were successfully fertilized at the first polar body phase, i. e., six to four hours before ovulation, than before or after this time. It was also noted that, although the number of ova transferred varied from 6 to 10, the maximum number of hybrid young obtained was 4. This was apparently not the result of damage to the transferred ova, since the data show that more young were carried in the experimental cornu than in the control cornu and the transferred ova had at least as good a chance as the normally ovulated ova. Furthermore, the uterine capacity would not seem to be the limiting factor, since in superovulated animals more than double the average litter may be carried to term. Noyes tentatively suggests that the cause may be relative progesterone deficiency, since this technique results in an unphysiological preponderance of ova compared with corpora lutea.

Noyes thinks these findings might ultimately prove of significance in studies of human infertility. After reviewing possible methods by which ripe human follicular ova might be obtained, including the perfusion of human ovaries in vitro, he emphasizes that other problems involving sperm, fertilization, growth, and implantation remain to be solved before pregnancy can be successfully induced by transferring human ova.

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[1] Noyes, R. E.: Fertilization of Follicular Ova, Fertil. & Steril. 3: 1, 1952.

ORGANIZATION SECTION

ANNUAL A. M. A. MEETING TO BE TELEVISED

Two half-hour network telecasts of the 101st Annual Session of the American Medical Association in Chicago, June 9-13, will be presented. Mobile television cameras will transmit the news to the nation as medical authorities report on the latest developments in the field of medicine.

The programs will be carried on 36 NBC television stations at 8:30 p. m. (C.D.S.T.) Tuesday, June 10, and on 15 NBC television stations at 9:00 p. m. (C.D.S.T.) Wednesday, June 11. The sponsor will be the Smith, Kline and French Laboratories of Philadelphia, in cooperation with the American Medical Association.

The telecasts will also present some of the highlights of the hundreds of scientific exhibits to be displayed at the Navy Pier in Chicago. Among other presentations will be symposiums on heart and blood vessel diseases, obesity and diabetes, and methods of lifesaving.

Local time and station schedules of the telecasts will be found on advertising page 25 in this issue of THE JOURNAL.

DR. BAUER'S INAUGURAL ADDRESS TO BE BROADCAST NATIONWIDE

Both the ABC and Mutual networks will broadcast the presidential inaugural address of Dr. Louis H. Bauer at 7:30 p. m. (C.D.S.T.), Tuesday, June 10, during the 101st Annual Session of the American Medical Association in Chicago. Originating from the Grand Ballroom of Chicago's Palmer House, the broadcast will be part of a special meeting of the House of Delegates. Physicians, their families and guests are cordially invited. Doors open at 7 p. m.

STATE MEDICAL LEGISLATION

Massachusetts

Bills Introduced.—H. 916, proposes to authorize a committee on the judiciary to make an investigation and study relative to the evidential value of certain blood tests in connection with the trial of persons charged with operating a motor vehicle while under the influence of intoxicating liquor. H. 2358, relating to the powers and duties of the state board of vocational education, proposes that rehabilitation facilities shall include medical, surgical, hospital, prosthesis, vocational, educational, and physical restoration services and directs the state board of vocational education to establish a list of physicians qualified to render competent rehabilitation services.

Bill Enacted.—H. 2207, has become Res. Ch. 38 of the Resolves of 1952. It revives and continues for the purpose of continuing its study a special commission established to study the advisability of establishing a medical and dental school under the auspices of the University of Massachusetts to be located in the city of Boston.

Michigan

Bills Enacted.—H. 165, has become Public Act No. 237 of the Acts of 1952. It authorizes the department of welfare to inspect and license convalescent homes and homes for the aged and to enforce, through use of the injunctive process, any reasonable orders fixing minimum standards for the care and supervision, personnel, sanitation, fire protection, food, and comfortable lodging of such institutions. S. 144, has become Public Act No. 266 of the Acts of 1952. It restricts the sale of narcotic drugs to persons licensed to sell them and defines the term narcotic as including cocaine, opium, morphine, codeine, heroin, chloral hydrate, all parts of the plant Cannabis sativa and any substance or synthetic narcotic drug which the bureau of narcotics of the United States treasury department has designated as "narcotic."

New Jersey

Bills Enacted.—A. 207, has become Ch. 119 of the Laws of 1952. It authorizes the board of freeholders of any county not having a mental or psychiatric hospital to appropriate money for the necessary expense incident to the diagnosis and treatment of such indigent residents of the county as may require psychiatric diagnosis and treatment, including the cost of diagnosis, special mental tests, and treatment. A. 306, has become Ch. 137 of the Laws of 1952. It amends the pharmacy act so as to require proper labeling and filing of prescriptions and requires every registered pharmacist who fills a prescription to place his name or initials upon the original prescription or on the label affixed to the container in which the prescription is dispensed or in a book kept for the purpose of recording prescriptions and authorizes the board of pharmacy or its agents to inspect the prescription files of pharmacists. A. 327, has become Ch. 152 of the Laws of 1952. It authorizes the borad of education to exclude a teacher or pupil who has not been successfully vaccinated but authorizes such board to excuse such person if the person presents a written statement signed by himself, or a guardian of a pupil, objecting to the vaccination on the ground that it interferes with the free exercise of his religious principles. A. 329, has become Ch. 153 of the Laws of 1952. It authorizes the board of education of a school district to require immunization to diphtheria as a prerequisite to school attendance but also authorizes the board to exempt a pupil from such requirement when the pupil presents a statement from his parents objecting thereto on the ground that the proposed immunization interferes with the free exercise of his religious principles. A. 526, has become Ch. 120 of the Laws of 1952. It authorizes the board of freeholders of any county to establish and maintain a mental health program for the operation or the support of centers for the diagnosis and treatment of mental disorders. A. 542, has become Ch. 121 of the Laws of 1952. It makes it a high misdemeanor for any person to hire, employ, or use any child under the age of 18 years to sell, transport, or offer for sale any narcotic drug. A. 554, has become Ch. 122 of the Laws of 1952. It authorizes the revocation of a license to practice medicine by the state board of medical examiners upon proof that a holder of such license habitually uses drugs. S. 38, has become Ch. 147 of the Laws of 1952. It prohibits a deduction from wages to defray the costs of any medical examination required of employees or prospective employees. S. 210, has become Ch. 127 of the Laws of 1952. It authorizes boards of education to employ optometrists licensed to practice within the state as school vision examiners.

A. M. G. A. GOLF TOURNAMENT AT MEDINAH COUNTRY CLUB

The Chicago Committee, headed by Dr. Robert J. Hawkins, has been successful in securing the facilities of the Medinah Country Club for the annual tournament of the American Medical Golfing Association in Chicago. It has three outstanding golf courses, which have often been selected for the National P. G. A. and other famous tournaments. The number three course is one of the outstanding courses in the country. The Chicago Committee will provide entertainment. Several boxing matches and a wrestling match are on the card for June 9th.

How to Get to Medinah

The Committee has arranged for bus service to and from the club on Monday, June 9. Buses will leave the Palmer House at 7 a. m., 8 a. m., 9:30 a. m., and 11 a. m., and will return at appropriate times. The round trip fare is $5.00.

Applications for Memberships

All male members of the American Medical Association are invited to become fellows of the American Medical Golfing Association by executing the application blank below and mailing it to the Secretary, Bob Elwell, 1420 Monroe Street, Toledo 2, Ohio. All fees are payable at the registration desk on June 9th.

American Medical Golfing Association

NAME ....
ADDRESS ....
CITY.................... ZONE... STATE.......
SPECIALITY..................................
AGE: Under 60 ☐ Over 60 ☐
HOME COURSE........................PAR.....
PLAYER'S CLUB HANDICAP............
New A. M. G. A. Fellows Check Here ☐

Prepared by the Bureau of Legal Medicine and Legislation.

MEDICAL NEWS

CALIFORNIA

Dr. Crowl Honored.—Dr. Verne C. Crowl, a member of the Los Angeles County Medical Association Council, has been honored by the city of Huntington Park by being named its "Outstanding Citizen of 1951," "for his continued and devoted work in YMCA, Kiwanis Youth activity, Chamber of Commerce, and as chief of staff at St. Francis Hospital."

Metabolic Research Laboratory Dedicated.—A laboratory for the study of causes and treatment of chronic diseases has been dedicated at the University of California School of Medicine, San Francisco. The Metabolic Research Laboratory for the study of arthritis and allied diseases was conceived years ago by Dr. William J. Kerr, professor of medicine. In 1950 the state legislature made an appropriation for the establishment of the laboratory. It has been in temporary quarters, with Dr. Leslie L. Bennett, professor of physiology, as acting director. Six beds in the University Hospital were assigned for patients under experimental treatment by the laboratory. Dr. Peter H. Forsham from Harvard University, Boston, has been made director. One function of the laboratory is to serve as a testing ground for new hormone materials, especially those prepared by Choh H. Li, Ph.D., professor of biochemistry on the Berkeley campus.

Health Workshop.—A workshop for teachers and students of health will be conducted June 23 to July 3 by the University of California School of Public Health, Berkeley, and the University Extension, with the cooperation of the California State Civil Defense Organization. This session, designed to provide appropriate objectives and scientific materials for instruction of college and high school students, will stress the importance of integrating disaster planning with the community health program. The undertaking has been endorsed by state departments of education, public health, and civil defense in most of the mountain and Pacific states. The course will consist of lectures, field trips, and demonstrations. Two units of credit will be given to persons fulfilling all workshop requirements. The registration fee of $30 covers transportation for the field trips and demonstrations and a portfolio of printed and mimeographed materials, including a complete syllabus, film lists, reading references, sets of examination questions, and other teaching aids, and provides for the loan of projection equipment for group use and of numerous films for review. Veterans may apply for federal benefits if the workshop is a part of their prescribed and recognized objectives approved by the Veterans Administration. Supplemental certificates of eligibility from the Veterans Administration must be dated on or before June 23 and must cover the fee in full. For information, write to the Department of Conferences and Special Activities, University Extension, University of California, Berkeley 4.

CONNECTICUT

Society News.—At the annual meeting of the Connecticut Association of Pathologists May 1, Dr. Roy N. Barnett, Norwalk, was reelected president and Dr. John E. Thayer, Hartford, secretary-treasurer.

Dermatological Association Prize Essay.—At the meeting of the American Dermatological Association, held in Colorado Springs, Colo., April 23-26, first prize in the annual essay contest was awarded to Dr. Paul D. Rosahn, New Britain, Conn., for his paper on "The Adverse Influence of Syphilitic Infection on the Longevity of Mice and Men."

Yale Summer School of Alcohol Studies.—Yale University Center of Alcohol Studies, New Haven, announces that the Summer School of Alcohol Studies will be in session from July 7 to Aug. 1. This program is designed to meet the needs of those requiring knowledge and understanding of alcoholic beverages, their functions, and the problems associated with their use. The curriculum emphasizes the need of a broadly oriented background in the biology, psychology, sociology, and history of the phenomena of alcoholic beverages before consideration of specific problems. The school is under the direction of Selden D. Bacon, Ph.D., associate professor of sociology and director of the Center of Alcohol Studies. Requests for information should be addressed to: Summer School of Alcohol Studies, Laboratory of Applied Physiology, Yale University, 52 Hillhouse Ave., New Haven.

DISTRICT OF COLUMBIA

Freedmen's Hospital Alumni Meeting.—The annual meeting of the Association of Former Interns and Residents of Freedmen's Hospital, Washington, D. C., will be held at the hospital June 9-12 under the presidency of Dr. Leonidas H. Berry of Chicago.

Personals.—Dr. Charlotte A. Donlan, clinical instructor in radiology at the medical school and radiotherapist at the hospital, recently assumed her new duties as director of the Cancer Detection Clinic of the George Washington University School of Medicine.——Dr. George B. Koelle on May 8 delivered the H. C. Hachmeister Lecture in Pharmacology under the auspices of Georgetown University School of Medicine, Washington, D. C., on "Pharmacological and Therapeutic Significance of Anticholinesterase Drugs."

IDAHO

State Association to Meet at Sun Valley.—The Idaho State Medical Association will hold its annual meeting at Sun Valley June 16-18 under the presidency of Dr. Alfred M. Popma of Boise. Guest speakers and their first presentations include:

Keith S. Grimson, Durham, N. C., Surgery in Industrial Medicine as It Pertains to Ulcers and Hypertension.
John Parks, Washington, D. C., Office Gynecology.
Earl D. McBride, Oklahoma City, Disability Evaluation.
Samuel J. Lang, Evanston, Ill., Evaluation of Disability in Nonsurgical Afflictions of the Back.
L. Henry Garland, San Francisco, Common Errors in X-Ray Diagnosis.
Lewis A. Alesen, Los Angeles, The Physician's Responsibility as a Leader.

ILLINOIS

New Unit for University of Illinois.—The University of Illinois has started construction on a new classroom and laboratory building in the Medical Center District on Chicago's West side, which will permit the colleges of medicine, pharmacy, and dentistry to increase their enrollments. The six story structure at Wood and Polk streets will enable the College of Medicine to increase its enrollment from 166 to 190 students in each class. The College of Pharmacy will be able to increase its registration from 125 to 175 students per class, and the College of Dentistry will enroll 90 in each class instead of 80. The graduate college also will be able to accommodate more students in the health sciences.

Chicago

Personal.—Miss Gratia Esher Knobel, for many years executive secretary of the Institute of Medicine of Chicago, died at her home in Evanston March 19. Miss Margaret L. Plumley has been appointed to succeed Miss Knobel.

Dr. Arthur Abt Appointed Professor at Duke.—Dr. Arthur F. Abt has accepted an appointment as professor of pediatrics at The Duke University School of Medicine and as director, radio isotope unit, for the Veterans Administration Hospital at Durham, N. C., now nearing completion. Dr. Abt has practiced pediatrics in association with his father, Dr. Isaac A. Abt, since 1926. He has served on the board of the Infant Welfare Society; as consultant for the State of Illinois to the Nutrition Service, Municipal Social Hygiene Clinic; member of the Poliomyelitis

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Physicians are invited to send to this department items of news of general interest, for example, those relating to society activities, new hospitals, education and public health. Programs should be received at least three weeks before the date of meeting.

Aid Team, National Foundation for Infantile Paralysis; and a member of the Joint Maternal Welfare Committee of Cook County, Ill. He was lecturer on infectious diseases for the Chicago Tuberculosis Institute, attending physician for cardiac children in the Chicago public schools, and consultant in pediatrics to the Chicago Maternity Center. Dr. Abt was Pediatric Section representative to the Scientific Exhibits of the American Medical Association in 1939-1942, a member of the Council of the Chicago Medical Society, and past president of the Chicago Pediatric Society. He served with the Navy Medical Corps during World War II, has been on the staffs of St. Luke's Hospital, Sarah Morris Children's Hospital of Michael Reese Hospital, Chicago Lying-In Hospital, and Wesley Memorial Hospital of Chicago. He has been a member of the pediatric department of Northwestern University Medical School since 1926.

MASSACHUSETTS

Dr. Beecher Honored.—Dr. Henry K. Beecher of Boston has been made a Chevalier of the Legion of Honor by the President of France. The presentation was made by the consul general of Boston, M. Chambon, with the following citation: "Dr. Henry K. Beecher, professor of research in anesthesia at the Harvard Medical School, has rendered invaluable services to the science of medicine by his remarkable achievements in the field of his research. By his development of synthetic agents to replace morphine, he has moreover made an eminent contribution toward the relief of pain and earned the gratitude of all peoples. France is in the front line of those who feel called on to recognize publicly Dr. Beecher's services."

MICHIGAN

Personal.—Dr. Ruth E. Wagner of Royal Oak recently received the Chamber of Commerce's annual award of merit as the person who had given most unselfishly to the service of the community.

Conference on Health Statistics.—The second Conference on Public Health Statistics offered by the University of Michigan will be held at Ann Arbor, June 16-20. The meeting is designed to bring health officers, health program directors, and statisticians up to date on their common problems. After a review of the old techniques and methodology of public health statistics in their application to modern public health problems, a full day will be devoted to outlining the newer methods of using sampling techniques, particularly as applied to surveys of human populations.

Venereal Disease and Tuberculosis Surveys.—To determine the extent of venereal disease and tuberculosis in high incidence areas, the state health department and the Detroit Health Department are sponsoring a special detection project, which will end July 15. Areas to be surveyed are selected on the basis of known high incidence of venereal disease as determined by records of the Detroit Health Department. It is assumed that these areas will also have a high incidence of tuberculosis. Plans call for establishment of from 30 to 60 stations for taking blood samples of about 75,000 persons. Mobile x-ray units will be placed in operation in conjunction with the blood sampling stations so that chest roentgenograms can be obtained of the same persons who volunteer for the blood tests. Blood samples will be sent to the state health department laboratories for analysis, and the roentgenograms will be processed in the division of tuberculosis and venereal disease control. Positive venereal disease findings will be reported to the Detroit Social Hygiene Clinic. Indigent persons found to have venereal disease will be treated by the clinic; others will be referred to practicing physicians.

MISSOURI

Anesthesiologists Elect Officers.—At the annual meeting of the Missouri Society of Anesthesiologists held in St. Louis on March 30 Dr. Harold J. Freiheit of St. Louis was elected president; Dr. L. G. Johnson of Springfield, vice-president; Dr. Jean J. Merz of St. Louis, secretary; and Dr. A. Lester Saferstein of Kansas City, treasurer.

Institute of Biophysics.—St. Louis University announces the establishment of an Institute of Biophysics under the direction of Basile J. Luyet, D.Sc. Grants totaling $13,880 were recently awarded to Professor Luyet: $6,120 from the Public Health Service of the Federal Security Agency for a study of "Mode of Action of Glycerol in the Preservation of Life in Frozen Cells," $3,800 from the Jane Coffin Childs Memorial Fund for Medical Research for a "Comparative Study of the Survival of Various Embryonic and Adult Tissues After Ultra-Rapid Freezing," and $3,960 from the National Science Foundation for the study of "Survival of Vitrified and Dried Tissues and Organisms."

MONTANA

Lectures on Cancer and Heart Disease.—The Montana Medical Association in cooperation with the state board of health will sponsor a series of cancer lectures in the eastern part of the state. The lectures will be held in Havre, June 2; Wolf Point, June 3; Sidney, June 4; Miles City, June 5; Billings, June 6; and Bozeman, June 7. The guest speaker will be Dr. Frank B. Queen, professor of pathology, University of Oregon Medical School, Portland.——The Montana Medical Association in cooperation with the Montana Board of Health will present a series of heart lectures during the week of June 23, with Dr. Hans H. Hecht, associate professor of medicine, University of Utah College of Medicine, Salt Lake City, as guest speaker. The lectures will be held in Kalispell, June 23; Missoula, June 24; Butte, June 25; Livingston, June 26; Helena, June 27; and Great Falls, June 28.

NEBRASKA

Joint Meeting with Bar Association.—The Lancaster County Medical Society of Lincoln and the Lincoln Bar Association recently held a joint meeting at Lincoln. A clinic on medicolegal topics included: qualifications of the expert witness, criteria for evaluating medical specialists, fact versus opinion in medical evidence, and problems in relation to trauma and cancer and trauma and heart disease. Guest speaker for the occasion was Dr. Alan R. Moritz, director of the Institute of Pathology, Western Reserve University School of Medicine, Cleveland. After a banquet at the Hotel Cornhusker, Dr. Moritz gave an address on "Unexplained Death."

NEW YORK

Society News.—Erie County Medical Society has incorporated in its new by-laws a provision that one member of each committee must have been a member of the society for less than five years.

List of Cancer Detection Centers.—A folder prepared by the New York State Department of Health's Bureau of Cancer Control gives the location of cancer detection centers in New York State (exclusive of New York City), the name of the physician who directs the center, and hours for examination. The folder will be sent free on request directed to the Bureau of Cancer Control, New York State Department of Health, Albany.

Community Nutrition Institute.—Syracuse University and the Bureau of Nutrition, New York State Department of Health, are sponsoring the Community Nutrition Institute at the university, June 16-28. Out-of-state speakers include:

John E. Gordon, Boston, Epidemiology of Nutrition Studies.
Samuel W. Dooley, Boston, Growth and Development Studies.
J. Roswell Gallagher, Boston, Understanding the Adolescent.
William J. Dieckmann, Chicago, Influence of Diet on Maternal and Child Health.
Jean Mayer, Paris, France, Problems of Obesity.

Three hours' credit will be given for the course. The approximate cost for the institute is $120. For information write Prof. Anne Bourquin, Department of Food and Nutrition, College of Home Economics, Syracuse University, Syracuse 10.

New York City

Gift for Children's Pavilion.—The William J. Wollman Foundation will contribute one million dollars for the Children's Pavilion in the new building planned for University Hospital. It is to be a part of the New York University-Bellevue Medical

Other American men of medicine who have been honored through custodianship of the Gold Headed Cane by this association are:

Harold C. Ernst, late professor of bacteriology, Harvard School of Medicine, Boston.

William H. Welch, former professor of pathology and dean of the medical faculty, Johns Hopkins University, Baltimore.

Theobald Smith, former professor of comparative pathology, Harvard Medical School, Boston, and director of the Rockefeller Institute for Animal Pathology, Princeton University, Princeton, N. J.

Simon Flexner, former director of the Rockefeller Institute for Medical Research, New York.

James Ewing, former professor of pathology and later professor of oncology, Cornell University Medical College, New York.

Frank B. Mallory, former professor of pathology, Harvard Medical School, Boston, and pathologist at Boston City Hospital.

Ludvig Hektoen, former professor of pathology, University of Chicago, and director of the McCormick Institute for Infectious Diseases, Chicago.

Young Man Missing.—Information concerning the whereabouts of Allen Lehman, senior in electrical engineering at the City College of New York, is urgently sought by his parents, Mr. and Mrs. George Lehman, 8305 20th Ave., Brooklyn 14. Since he may be the victim of amnesia and may apply for or have received medical treatment, the following information is being brought to the attention of The Journal readers:

Allen Lehman

Age, 21; height 5 ft., 8 in.; weight, 150 lb.; light complexion; small scar under chin; dark brown hair, *parted on left side; wears* glasses with light colored shell rim. Speaks French; very intelligent; often whistles excerpts from classical music. Carries driver's license; selective service card #SS 50-37-29-846; membership card of American Youth Hostels (AYH); Federal Life and Casualty Hospitalization and Medical Insurance cards; and American Express Travelers checks ($10 denomination). Member of Scout Troop 183 and Explorer Post 177. May be wearing khaki Army woolen pants and field boots with initials "N. F." on inside; "T"-shirt with City College emblem. Last letter postmarked Aug. 8, 1951, from Fort William, Ontario, Canada; intended to hitchhike to Winnipeg and Vancouver, enter the U. S. in Washington, and visit an aunt in Santa Monica, Calif. May have gone to Mexico.

Anyone having information concerning Allen Lehman is urged to communicate with his parents at the above address or to contact them by telephone: ESplanade 2-0644.

Meeting of Health Officials from American Republics.—Health officials from Chile, the Dominican Republic, Ecuador, Mexico, Peru, and the United States met April 25 in Washington, D. C., as representatives of their countries on the executive committee of the Pan-American Sanitary Organization. The meeting was also attended by observers from Argentina, Colombia, France, Guatemala, The Netherlands, and Nicaragua. In an eight day session the delegates reviewed public health activities being carried out in the Western hemisphere with the technical assistance of the Pan-American Sanitary Bureau, regional office for the Americas of the World Health Organization. The delegates elected as chairman of this 16th meeting Dr. Nacianceno Romero of Chile and Dr. Jorge Estrella Ruiz of Peru as vice-chairman. The director of the Pan-American Sanitary Bureau, Dr. Fred L. Soper of New York, reported steady progress in decentralization of the bureau, which now has zone offices in Lima, Rio de Janeiro, Buenos Aires, and Guatemala. Negotiations are underway for a zone office in Mexico. Dr. Soper discussed the yellow fever situation in Central America and Brazil. In Panama, cases were reported in 1948, east of the Canal Zone. The following years saw the disease moving westward through Panama and in 1951 into Costa Rica. At the end of the year, cases were reported in Costa Rica on the Pacific slope of the mountains; and in 1952, additional cases have occurred in this area of Costa Rica and a single case was found in Panama. This would suggest that if a moving infection is involved, it traveled along the Atlantic Coast, crossed the mountains, and then spread in both directions on the Pacific Coast. In Brazil, 3,000 cases were reported in 1951 in the Goyas area, which had outbreaks in 1935 and in 1945. The spread of the disease was much more rapid during the 1951-52 season than during the corresponding spread in 1935. Dr. Soper also outlined the progress of the yaws eradication campaign in Haiti, and indicated that a new agreement extending the campaign for two more years had been signed between the government of Haiti and the World Health Organization. Following the director's report, Dr. Felipe Garcia Sanchez of Mexico gave an account of the intensive campaign against smallpox recently carried out in Mexico, as the result of which not a single case of smallpox was reported during the past year.

FOREIGN

European Congress of Cardiology.—The first European Congress of Cardiology will be held in London, England, Sept. 9-12. The congress, which is being organized by the British Cardiac Society in collaboration with the presidents of the European Society of Cardiology, will be held at the University of London, Bloomsbury, W.C.1. Inquiries should be addressed to the Secretary of the Congress, Dr. K. Shirley Smith, Institute of Cardiology, 35 Wimpole St., London. W.1.

Journées Médicales of 1952.—The Journées Médicales will be held June 7-11 at the Palais des Académies in Brussels, Belgium. On Sunday there will be lectures on new data concerning cancer and pulmonary and osteoarticular tuberculosis. Topics for discussion will include medicine and surgery in children and diagnosis and treatment of meningitis and of alcoholism. Tuesday afternoon lectures will be on leptospirosis, uterine cancer, poliomyelitis, bacterial enzymes and occupational medicine. Monday and Tuesday mornings will be devoted to operative and clinical sessions.

New Hadassah-Hebrew University Medical Center.—Ground will be broken for the new Hadassah-Hebrew University Medical Center in Jerusalem on June 7. The medical center will contain a 430 bed university teaching hospital, a nurses' training school, an outpatient department, and new buildings for the Hebrew University-Hadassah Medical School. It is planned that the new center will not only become an advanced base for medical healing, teaching, and research in Jerusalem and Israel but ultimately make a very positive impact on the health and medical standards of the entire Middle East.

Society News.—The next annual general meeting of the Australian Society of Anaesthetists will be held in Melbourne, Victoria, between Aug. 25 and 29 under the presidency of Dr. Stuart V. Marshall of Sydney. A special invitation has been extended to Americans who can attend.——The Scandinavian Society of Anesthesiologists will hold its annual congress in Stockholm, Sweden, Aug. 8-9. The two main themes for the meeting are "Toxic Reactions and Bi-Effects in the Employment of Anesthetics," and "Curarizing Drugs (Chemistry, Pharmacology, Experimental Physiology)." Notification of attendance should be given by June 1 to the secretary, Dr. Henning Poulsen, Norre Alle 17B. Kobenhavn N., Denmark.

CORRECTION

Treatment of Argyria.—In the answer to the Query and Minor Note on argyria in The Journal, April 5, 1952, page 1264, the word "ferrocyanide" should read "ferricyanide."

EXAMINATIONS AND LICENSURE

BOARDS OF MEDICAL EXAMINERS

Alabama: *Examination.* Montgomery, June 24-26, 1952. Sec., Dr. D. G. Gill, 537 Dexter Ave., Montgomery 4.

Alaska:* *Examination.* Juneau. On application in other towns where there are board members. *Reciprocity.* On application. Sec., Dr. W. M. Whitehead, Box 140, Juneau.

Arkansas:* *Examination. Regular.* Little Rock, June 5-6. Sec., Dr. Joe Verser, Harrisburg. *Homeopathic.* Little Rock, June 10-11. Sec., Dr. Carl S. Bungart, 105 N. 14th St., Fort Smith. *Eclectic.* Little Rock, June 5-6. Sec., Dr. Frank C. Smith, 2301 Broadway, Little Rock.

California: *Written.* San Francisco, June 23-26; Los Angeles, Aug. 18-21; Sacramento, Oct. 20-23. Application must be received at least two weeks prior to date of examination. *Oral for Reciprocity Applicants.* San Francisco, June 21; Los Angeles, Aug. 16; San Francisco, Nov. 8. Applicants are requested not to arrange to come to an oral examination until they receive notice from the Credentials Committee. *Oral and Clinical for Foreign Medical School Graduates.* San Francisco, June 22; Los Angeles, Aug. 17; San Francisco, Nov. 9. Sec., Dr. Frederick N. Scatena, 1020 N St., Sacramento.

Colorado:* *Examination.* Denver, June 10-12. Final date for filing application was May 12. *Reciprocity.* Denver, July 8. Applications accepted through June 9. Sec., Dr. Samuel H. Brown, 831 Republic Bldg., Denver.

Connecticut:* *Regular. Examination.* Hartford, July 8-9. Sec. to the Board, Dr. Creighton Barker, 160 St. Ronan St., New Haven. *Homeopathic.* Derby, July 8-9. Sec., Dr. Donald A. Davis, 38 Elizabeth St., Derby.

Delaware: Dover, July 8-10. Sec., Dr. Joseph S. McDaniel, 229 South State St., Dover.

Florida:* *Examination.* Jacksonville, June 29-July 1. Sec., Dr. Homer L. Pearson, 701 Dupont Bldg., Miami.

Georgia: Atlanta, June 10-11. Sec., Mr. R. C. Coleman, 111 State Capitol, Atlanta 3.

Guam: The Commission on Licensure will meet whenever a candidate appears or submits his credentials. Ex. Sec., Dr. Austin W. Matthis, Agana.

Hawaii: *Examination.* Honolulu, July 14-17. Sec., Dr. I. L. Tilden, 1020 Kapiolani St., Honolulu.

Idaho: Boise, July 14-16. Sec., Mr. Armand L. Bird, 305 Sun Bldg., Boise.

Illinois: *Examination.* Chicago, June 24-26 and Oct. 7-9. Supt. of Regis., Mr. Charles F. Kervin, Capitol Bldg., Springfield.

Indiana: Indianapolis, June 1952. Sec., Dr. Paul R. Tindall, 538 K of P Bldg., Indianapolis 4.

Iowa:* *Examination.* Iowa City, June 9-11. Acting Sec., Dr. Walter L. Bierring, 1027 Des Moines St., Des Moines.

Kansas: Kansas City, June 4-5. Sec., Dr. O. W. Davidson, 864 New Brotherhood Bldg., Kansas City.

Kentucky: *Examination.* Louisville, June 3-5. Sec., Dr. Bruce Underwood, 620 S. Third St., Louisville.

Louisiana: *Regular.* New Orleans, June 4-6. Sec., Dr. Roy B. Harrison, 1507 Hibernia Bank Bldg., New Orleans 12. *Homeopathic. Subject to Call.* Sec., Dr. F. H. Hardenstein, 1714 Pere Marquette Bldg., New Orleans.

Maine: Augusta, July 8-9. Sec., Dr. Adam P. Leighton, 192 State St., Portland.

Maryland: *Examination.* Baltimore, June 17-20. Sec., Dr. Lewis P. Gundry, 1215 Cathedral St., Baltimore. *Homeopathic.* Baltimore, June 17-18. Sec., Dr. John A. Evans, 6029 Bellona Ave., Baltimore.

Massachusetts: Boston, July 8-11. Sec., Dr. Robert C. Cochrane, Room 37, State House, Boston.

Michigan:* *Examination.* Ann Arbor and Detroit, June 9-11. Sec., Dr. J. E. McIntyre, 100 W. Allegan St., Lansing 8.

Minnesota:* Minneapolis, June 17-19. Sec., Dr. J. F. DuBois, 230 Lowry Medical Arts Bldg., St. Paul 2.

Mississippi: *Examination.* Jackson, June 23-24. *Reciprocity.* Jackson, June 25. Asst. Sec., Dr. R. N. Whitfield, Old Capitol, Jackson.

Missouri: *Examination.* St. Louis, June 13-14. Ex. Sec., Mr. John A. Hailey, Box 4, State Capitol Bldg., Jefferson City.

Nebraska: *Examination.* Omaha, June 16-18. Director, Mr. Husted K. Watson, Bureau of Examining Boards, Room 1009, State Capitol, Lincoln.

Nevada:* Carson City, Aug. 4. Sec., Dr. George H. Ross, 112 Curry St., Carson City.

New Hampshire: Concord, Sept. 10. Sec., Dr. John S. Wheeler, 107 State House, Concord.

New Jersey: *Examination.* Trenton, June 17-20. Sec., Dr. E. S. Hallinger, 28 W. State St., Trenton.

New York: Albany, Buffalo, New York and Syracuse, June 24-27. Sec., Dr. Stiles D. Ezell, 23 S. Pearl St., Albany.

North Carolina: *Written.* Raleigh, June 16-19; *Reciprocity.* Raleigh, June 17. Sec., Dr. Joseph J. Combs, 419 Professional Bldg., Raleigh.

North Dakota: *Examination.* Grand Forks, July 9-11. *Reciprocity.* Grand Forks, July 12. Sec., Dr. C. J. Glaspel, Grafton.

Ohio: *Examination.* Columbus, June 17-20. Sec., Dr. H. M. Platter, 21 W. Broad St., Columbus 15.

Oklahoma:* *Examination.* Oklahoma City, June 4-5. Sec., Dr. Clinton Gallaher, 813 Braniff Bldg., Oklahoma City.

Oregon:* *Eaxmination.* Portland, July 7-9. Final date for filing application is June 16. Exec. Sec., Mr. Howard I. Bobbitt, 609 Failing Bldg., Portland.

Pennsylvania: *Examination.* Philadelphia and Pittsburgh, July 8-10. Acting Sec., Mrs. M. G. Steiner, 351 Education Bldg., Harrisburg.

Rhode Island: *Examination.* Providence, July 2-3. Administrator of Professional Regulations, Mr. Thomas B. Casey, 366 State Office Bldg., Providence.

South Carolina: *Examination.* Columbia, June 23-24. Sec., Dr. N. B. Heyward, 1329 Blanding St., Columbia.

South Dakota:* Rapid City, July 15. Sec., Dr. C. B. McVay, Yankton Clinic, Yankton.

Tennessee:* *Examination.* Memphis and Nashville, June 11-12. Sec., Dr. H. W. Qualls, 1635 Exchange Bldg., Memphis.

Texas: Fort Worth, June 19-21. Sec., Dr. M. H. Crabb, 1714 Medical Arts Bldg., Fort Worth.

Utah: *Examination.* Salt Lake City, July 9-11. *Reciprocity.* Salt Lake City, June 20. Asst. Dir., Mr. Frank E. Lees, 314 State Capitol Bldg., Salt Lake City 1.

Vermont: *Examination.* Burlington, June 16-18. Sec., Dr. F. J. Lawliss, Richford.

Virginia: *Examination.* Richmond, June 12-14. *Reciprocity.* Richmond, June 11. Sec., Dr. K. D. Graves, 631 First St., S.W., Roanoke.

Virgin Islands: St. Thomas, June 4-5. Sec., Dr. Earle M. Rice, St. Thomas.

Washington:* *Examination.* Olympia, July. Sec., Department of Licenses, Mr. Edward C. Dohm, Olympia.

West Virginia: Charleston, July. Sec., Dr. N. H. Dyer, State Office Bldg., No. 3, Charleston 5.

Wisconsin:* Milwaukee, July 8-10. Sec., Dr. A. G. Koehler, 46 Washington Blvd., Oshkosh.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

Alaska: *Examination.* On application. Juneau or other towns in Territory as decided by Board. *Reciprocity.* On application. Sec., Dr. C. Earl Albrecht, Box 1931, Juneau.

Arizona: *Examination.* Tucson, June 17. Sec., Mr. H. D. Rhodes, University of Arizona, Tucson.

Connecticut: *Examination.* New Haven, June 14. Address: State Board of Healing Arts, 110 Whitney Ave., New Haven 10.

Florida: Gainesville, June 7. *Examination.* Sec., Mr. M. W. Emmel, Box 340, University of Florida, Gainesville.

Iowa: *Examination.* Des Moines, July 8. Sec., Dr. Ben H. Peterson, Coe College, Cedar Rapids.

Michigan: *Examination.* Detroit and Ann Arbor, Oct. 10-11. Sec., Mrs. Anne Baker, 423 W. Michigan Ave., Lansing.

Nebraska: *Examination.* Omaha, Oct. 7-8. Director, Bureau of Examining Boards, Mr. Husted K. Watson, 1009 State Capitol Bldg., Lincoln.

Oregon: *Examination.* Portland, June 7, Sept. 6 and Dec. 6. Sec., Dr. Charles D. Byrne, State Board of Higher Education, University of Oregon, Eugene.

Rhode Island: *Examination.* Providence, Aug. 13. *Administrator of Professional Regulations,* Mr. Thomas B. Casey, 366 State Office Bldg., Providence.

South Dakota: Vermillion, June 13-14. Sec., Dr. Gregg M. Evans, 310 E. 15th St., Yankton.

Texas: *Examination.* Austin, October. Sec., Brother Raphael Wilson, 407 Perry-Brooks Bldg., Austin.

Wisconsin: *Examination.* Milwaukee, June 7 and Sept. 13. Sec., Mr. W. H. Barber, Ripon College, Ripon.

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* Basic Science Certificate required.

MEETINGS

American Medical Association, Chicago, June 9-13. Dr. George F. Lull, 535 North Dearborn St., Chicago 10, Secretary.

American Academy of Tuberculosis Physicians, Chicago, June 7. Dr. Oscar S. Levin, P. O. Box 7011, Denver, Secretary.

American Association of Genito-Urinary Surgeons, Seaview Country Club, Absecon, N. J., June 19-21. Dr. Norris J. Heckel, 122 South Michigan Ave., Chicago 3, Secretary.

American Association on Mental Deficiency, Hotel Bellevue-Stratford, Philadelphia, May 26-31. Dr. Neil A. Dayton, P. O. Box 96, Willimantic, Conn., Secretary.

American Blood Irradiation Society, Conrad Hilton Hotel, Chicago, June 7-8. Dr. H. T. Lewis. 5230 Center Ave., Pittsburgh, Secretary.

American College of Chest Physicians, Congress Hotel, Chicago, June 5-8. Mr. Murray Kornfeld, 112 East Chestnut St., Chicago, Executive Secretary.

American Diabetes Association, Drake Hotel, Chicago, June 7-8. Dr. J. A. Reed, 11 West 42d St., New York 36, Secretary.

American Geriatrics Society, Hotel LaSalle, Chicago, June 5-7. Dr. Malford W. Thewlis, 25 Mechanic St., Wakefield, R. I., Secretary.

American Hearing Society, Chicago, June 28. Mrs. Francis E. Lee, 817 14th St. N.W., Washington 5, D. C., Secretary.

American Medical Women's Association, Chicago, June 8. Dr. Lucille Marsh, 1168 Briarcliff Road, N.E., Atlanta, Ga., Corresponding Secretary.

American Ophthalmological Society, Hot Springs, Va., June 5-7. Dr. Maynard C. Wheeler, 30 West 59th St., New York 19, Secretary.

American Orthopedic Association, London, England, June 30-July 4. Dr. C. Leslie Mitchell, Henry Ford Hospital, Detroit 2, Secretary.

American Proctologic Society, Milwaukee, June 4-7. Dr. Stuart T. Ross, 131 Fulton Ave., Hempstead, L. I., N. Y., Secretary.

American Radium Society, Chicago, June 8. Dr. John Wirth, 635 Herkimer St., Pasadena 1, Calif., Secretary.

American Rheumatism Association, Conrad Hilton Hotel, Chicago, June 6-7. Dr. William H. Kammerer, 33 East 61st St., New York 21, Secretary.

American Society for the Study of Sterility, Chicago, June 7-8. Dr. Walter W. Williams, 20 Magnolia Terrace, Springfield 8, Mass., Secretary.

American Therapeutic Society, Blackstone Hotel, Chicago, June 5-8. Dr. Oscar B. Hunter Jr., 915 Nineteenth St. N.W., Washington 6, D. C., Secretary.

American Trudeau Society, Hotel Statler, Boston, May 26. Dr. John D. Steele, 1790 Broadway, New York 19, Secretary.

American Urological Association, Chalfonte-Haddon Hall, Atlantic City, N. J., June 23-26. Dr. Charles H. deT. Shivers, Boardwalk National Arcade Bldg., Atlantic City, N. J., Secretary.

American Veterinary Medical Association, Ambassador Hotel, Atlantic City, N. J., June 23-26. Dr. J. C. Hardenbergh, 600 South Michigan Ave., Chicago 5, Executive Secretary.

Catholic Hospital Association of the United States and Canada, Cleveland, May 26-29. Rev. John J. Flanagan, S.J., 1438 South Grand Blvd., St. Louis 4, Director.

Idaho State Medical Association, Sun Valley, June 15-18. Dr. Robert S. McKeon, 305 Sun Bldg., Boise, Secretary.

Maine Medical Association, Samoset Hotel, Rockland, June 22-24. Mr. W. Mayo Payson, 142 High Street, Portland 3, Executive Secretary.

Medical Library Association, Lake Placid Club, Lake Placid, N. Y., June 24-27. Miss Caroline Riechers, 1758 West Harrison St., Chicago 12, Secretary.

Minnesota State Medical Association, Minneapolis, May 26-28. Dr. B. B. Souster, 496 Lowry Medical Arts Bldg., St. Paul 2, Secretary.

National Tuberculosis Association, Copley Plaza and Statler Hotels, Boston, May 26-30. Mr. Kemp D. Battle, 1790 Broadway, New York 19, Secretary.

North American Chapter, International Society of Angiology, Conrad Hilton Hotel, Chicago, June 7. Dr. Henry Haimovici, 105 East 90th St., New York 28, Secretary.

Society for Investigative Dermatology, Hotel Sherman, Chicago, June 7-8. Dr. Herman Beerman, 255 South 17th St., Philadelphia 3, Secretary.

Society for Vascular Surgery, Chicago, June 8, Dr. George D. Lilly, 331 Ingraham Bldg., Miami 32, Fla., Secretary.

The Endocrine Society, Palmer House, Chicago, June 5-7. Dr. Henry H. Turner, 1200 North Walker St., Oklahoma City 3, Secretary.

Upper Peninsula Medical Society, Country Club, Iron Mountain, Mich., June 27-28. Dr. E. Theodore Palm, 412 Superior Ave., Crystal Falls, Mich., Secretary.

Wyoming State Medical Society, Nobel Hotel, Lander, June 5-7. Dr. Glenn W. Koford, 2020 Carey Ave., Cheyenne, Secretary.

INTERNATIONAL

Australasian Medical Congress, Melbourne Victoria, Australia, Aug. 22-30. Dr. C. H. Dickson, Medical Society Hall, 426 Albert St., East Melbourne, Victoria, Australia, General Secretary.

Commonwealth and Empire Health and Tuberculosis Conference, Central Hall, London, England, July 8-13. Dr. J. H. Harley Williams, Tavistock House North, Tavistock Sq., London, W.C.1, England, Secretary General.

Congress of the International Diabetes Federation, Leyden, Netherlands, July 7-12. Dr. F. Gerritzen, 33, Prinsegracht, The Hague, Netherlands, Secretary.

European Congress of Cardiology. University of London, Bloomsbury, W.C.1, England, Sept. 10-12. Dr. K. Shirley Smith, 35 Wimpole St., London, W.1, England, Secretary.

European Society of Cardiovascular Surgery, Strasbourg, France, Oct. 3-4. Sir James Learmonth, Department of Surgery, University New Buildings, Edinburgh 8, Scotland.

Interamerican Cardiological Congress, Buenos Aires, Argentina, Aug. 31-Sept. 7. Dr. Blas Moia, Larrea 1132, Buenos Aires, Argentina, Secretary-General.

Inter-American Congress of Public Health, Havana, Cuba, Sept. 27-Oct. 1. Pan-American Sanitary Bureau, 2001 Connecticut Ave., Washington, D. C.

Inter-American Congress of Radiology, Mexico City, Mexico, Nov. 2-8. Dr. Guido Torres Martinez, Marsella No. 11, Mexico, D.F., Secretary-General.

International Congress of Biochemistry, Paris, France, July 21-27. Prof. Jean Courtois, 4, Avenue de l'Observatoire, Paris 6^{e}, France, Secretary.

International Congress of Dermatology and Syphilology, London, England, July 21-26. Dr. Gordon B. Mitchell-Heggs, 5, Lisle St., London, W.C.2, England, General Secretary.

International Congress of Dietetics, Royal Tropical Institute, Amsterdam, The Netherlands, July 7-11. Miss Diane J. Ten Haaf, Educational Bureau of the Nutritional Council, 42 Koninginnegracht, The Hague, Netherlands, General Secretary.

International Congress on Diseases of the Chest, Rio de Janeiro, Brazil, Aug. 24-30. Mr. Murray Kornfeld, 112 East Chestnut St., Chicago 11, Illinois, Executive Secretary.

International Congress of Haematology, Mar del Plata, Argentina, Sept. 21-26. Dr. Carlos Reussi, Anchorena 1710, Buenos Aires, Argentina, Secretary.

International Congress of Health Technicians, Palais de la Mutualite, Paris, France, June 9-14. Secretariat General, 6 Square Desaix, Paris XV^{e}, France.

International Congress of the History of Medicine, Nice-Cannes, France, and Monaco, Sept. 8-18. Dr. F. A. Sondervorst, 124 Avenue des Allies, Louvain, Belgium, Secretary-General.

International Congress on Hydatid Disease, Santiago, Chile, Nov. 21-24. Organizing Committee, P. O. Box 9183, Santiago, Chile.

International Congress of Internal Medicine, Friends House, London, N.W.1, Eng. Sept. 15-18. Sir Harold Boldero, 12 Pall Mall East, London, S.W.1, England, Secretary.

International Congress on Medical Records, London, England, Sept. 7-12. Miss Gwen Perkins, 120 C Street S.E., Washington, D. C., Chairman.

International Congress of Medicine and Sport, Paris, France. May 29-June 1. Prof. Chailley-Bert, 1 rue Lacretelle, Paris 15^{e}, France, Chairman.

International Congress on Neuropathology, Rome, Italy, Sept. 8-13. Dr. Armando Ferraro, 722 W. 168th St., New York, N. Y., U. S. A., Secretary General.

International Congress of Physical Medicine, London, England, July 14-19. Dr. A. C. Boyle, 45, Lincoln's Inn Fields, London, W.C.2, England, Hon. Secretary.

International Congress of Physiopathology of Animal Reproduction and Artificial Insemination, Copenhagen, Denmark, July 7-10. Prof. Ed. Sorensen, The Royal Veterinary and Agricultural College, Bülowsvej 13, Copenhagen V, Denmark.

International Congress of Urology, The Waldorf-Astoria, New York, N. Y., U. S. A., Sept. 15-18. Dr. John A. Taylor, 2 East 54th St., New York, N. Y., U. S. A., Secretary-General.

International Society of Geographic Pathology, Liège, Belgium, July 15-18. Dr. Fred C. Roulet, Habelstr. 24, Basel, Switzerland, Secretary General.

International Union Against Tuberculosis, Rio de Janeiro, Brazil, Aug. 24-27. Prof. Etienne Bernard, 66 Blvd. St. Michel, Paris 6e, France, Secretary-General.

Neuroradiologic Symposium, Stockholm, Sweden, Sept. 17-20. Docent Ake Lindbom, Symposium Neuroradiologicum, Serafimerlasarettet, Stockholm K., Sweden, Secretary.

World Medical Association, Athens, Greece, Oct. 12-16. Dr. Louis H. Bauer, 2 East 103d St., New York 29, N. Y., Secretary General.

DEATHS

Pemberton, Frank Arthur ⊕ Boston; born in Auburndale, Mass., in 1884; Harvard Medical School, Boston, 1909; served as clinical professor of gynecology, Harvard Medical School, Courses for Graduates; assistant in gynecology at his alma mater from 1911 to 1925, instructor in gynecology from 1926 to 1932, and clinical professor of gynecology and head of the department of gynecology from 1933 to 1946; specialist certified by the American Board of Obstetrics and Gynecology; in 1935 president of the Obstetrical Society of Boston; member of the American Gynecological Society of which he was vice-president in 1939, New England Obstetrical and Gynecological Society serving as president in 1942-1943, New England Surgical Society, Boston Surgical Society, and the American Urological Association; fellow of the American College of Surgeons; for many years affiliated with Free Hospital for Women, New England Deaconess Hospital, and Palmer Memorial Hospital; died in Fort Lauderdale, Fla., March 6, aged 67, of coronary occlusion.

Pfunder, Malcolm Chester ⊕ Minneapolis; born in Two Creeks, Wis., Jan. 19, 1888; Rush Medical College, Chicago, 1920; certified by the National Board of Medical Examiners; specialist certified by the American Board of Otolaryngology; member of the American Academy of Ophthalmology and Otolaryngology; fellow of the American College of Surgeons; past president of the Hennepin County Medical Society and the Minnesota Academy of Ophthalmology and Otolaryngology; served as a fellow in ophthalmology at the Mayo Foundation in Rochester, Minn.; formerly on the faculty of the University of Minnesota Medical School, where he had been clinical assistant professor of ophthalmology; affiliated with Swedish, Lutheran Deaconess, Minneapolis General, Fairview, and Mount Sinai hospitals; died Jan. 23, aged 64, of carcinoma of the stomach.

Shands, Harley R. ⊕ Jackson, Miss.; born in Senatobia, Miss., Feb. 27, 1881; Medical Department of Tulane University of Louisiana, New Orleans, 1905; member of the founders' group of the American Board of Surgery; member and in 1927 vice president of the Southern Surgical Association; life member, and from 1927 to 1933 member of the board of governors of the American College of Surgeons; past president of the Mississippi State Medical Association; consulting surgeon, Mississippi State Charity Hospital in Jackson and Mississippi State Tuberculosis Sanatorium in Sanatorium; visiting surgeon, Mississippi Baptist Hospital, where he was a member of the board of trustees and where he died March 17, aged 71, of acute pulmonary edema.

Riker, George Albert ⊕ Medical Inspector, Commander, U. S. Navy, retired; Newport, R. I.; born in Philadelphia Oct. 21, 1879; Jefferson Medical College of Philadelphia, 1905; commissioned in the medical corps of the Navy June 11, 1909; served aboard the USS South Dakota, USS Franklin, USS Louisiana, and various ships in Asiatic waters; his shore duty included service at Receiving Station, Washington, D. C., Navy Yard, Washington, D. C., Naval Hospital, Great Lakes, Ill., and Naval Training Station, Newport, R. I.; placed on the retired list with the rank of commander, by reason of physical disability, on Nov. 1, 1936; died in the U. S. Naval Hospital Feb. 1, aged 72, of burns.

Perdue, J. Randolph ⊕ Miami, Fla.; born in Rocky Mount, Va., July 29, 1908; University of Virginia Department of Medicine, Charlottesville, 1932; specialist certified by the American Board of Obstetrics and Gynecology; member of the Southeastern Surgical Congress, Southern Medical Association, and the South Atlantic Association of Obstetricians and Gynecologists, of which he had been president; fellow of the American College of Surgeons; formerly vice-president of the Florida East Coast Medical Association; affiliated with the Jackson Memorial Hospital; on the staffs of Mount Sinai Hospital and St. Francis Hospital in Miami Beach, where he died March 27, aged 43.

Newell, Edward Dunbar ⊕ Chattanooga, Tenn.; Medical Department of Tulane University of Louisiana, New Orleans, 1897; past president of the Southern Railway Surgeons Association and Chattanooga-Hamilton County Medical Society; member of the House of Delegates of the American Medical Association in 1906; member of the Southern Surgical Association; fellow of the American College of Surgeons; member of the founders' group of the American Board of Surgery; served during World War I; co-founder of the Newell and Newell Sanitarium, now known as the Newell Hospital, where he died Feb. 13, aged 79, of a heart attack.

Hageman, George Ricker ⊕ Longmont, Colo.; born in Washington, Kan., Jan. 14, 1891; University of Michigan Medical School, Ann Arbor, 1919; specialist certified by the American Board of Otolaryngology; member of the American Academy of Ophthalmology and Otolaryngology; fellow of the American College of Surgeons; served during World War I; formerly practiced in Brooklyn, where he was on the staff of the Long Island College Hospital; on the staff of the Longmont Hospital; died in the Presbyterian Hospital, Denver, March 3, aged 61, of coronary thrombosis.

Palmer, Don Henry ⊕ Seattle; Rush Medical College, Chicago, 1903; member of the House of Delegates of the American Medical Association in 1916 and 1922, and an Associate Fellow; specialist certified by the American Board of Plastic Surgery; served as surgeon to federal prisoners; fellow of the American College of Surgeons; affiliated with Swedish, Providence, Doctors, Maynard, and Seattle General hospitals in Seattle and Renton (Wash.) Hospital; for many years physician for the University of Washington athletic teams; died in Seattle General Hospital March 18, aged 74.

Haigh, John Ellingworth, Dayton, Ohio; University of Toronto Faculty of Medicine, Toronto, Canada, 1909; died Dec. 25, aged 70.

Halley, William B., Ballinger, Texas; University of Texas School of Medicine, Galveston, 1897; died Dec. 6, aged 82, of coronary accident and arteriosclerosis.

Hoch, Charles Martin Jr., Smithville, Texas; University of Texas School of Medicine, Galveston, 1935; member of the American Medical Association; served as secretary of the Bastrop County Medical Society; member of the American Academy of General Practice; died recently, aged 39.

Hubbs, Elwood Samuel, Philadelphia; Hahnemann Medical College and Hospital of Philadelphia, 1898; died Feb. 17, aged 75, of carcinoma of the throat.

Hunter, Ira Ellis, Toledo, Ohio; Miami Medical College, Cincinnati, 1900; died Jan. 5, aged 82.

King, Charlton Roper, Arlington, Va.; George Washington University School of Medicine, Washington, D. C., 1920; formerly connected with the U. S. Public Health Service; died in St. Petersburg, Fla., Jan. 17, aged 55.

Leach, James Edward, Gadsden, Ala.; University of Nashville Medical Department, 1900; member of the American Medical Association; died Jan. 23, aged 74, of hypertensive cardiovascular disease.

Long, Charles-Francis ⊕ Philadelphia; University of Pennsylvania School of Medicine, Philadelphia, 1923; acting associate professor of industrial medicine at Woman's Medical College of Pennsylvania; chairman of the commission on industrial health and hygiene of the Medical Society of the State of Pennsylvania; member of the Industrial Medical Association; fellow of the College of Physicians of Philadelphia; on the staff of the Episcopal Hospital; medical director, Bayuk Cigars, Inc.; died Feb. 28, aged 53, of pulmonary edema and myocardial failure.

Loving, Maribel ⊕ Austin, Texas; University of Texas School of Medicine, Galveston, 1935; died recently, aged 44, of coronary occlusion.

⊕ Indicates Fellow of the American Medical Association.

Lyncker, Nicolas, Jacksonville, Fla.; National Medical University, Chicago, 1909; died Jan. 26, aged 76, of cerebral vascular accident and arteriosclerosis.

McCain, William Jasper, Livingston, Ala.; Medical College of Alabama, Mobile, 1891; member of the American Medical Association; died Jan. 21, aged 86, of coronary occlusion.

McCandless, Everette LeRoy, West Sunbury, Pa.; Maryland Medical College, Baltimore, 1910; died recently, aged 68, of myocardial degeneration and arteriosclerosis.

McCurley, Beman Guy, Cortland, Ohio; the Hahnemann Medical College and Hospital, Chicago, 1899; served as president of the county board of health; affiliated with Trumbull Memorial Hospital in Warren; a director of the Cortland Savings and Banking Company; died Dec. 18, aged 75, of arteriosclerosis.

McDuffie, Harold Fritz, Jacksonville, Fla.; New York Homeopathic Medical College and Flower Hospital, New York, 1913; past president of the Georgia State Board of Medical Examiners; formerly practiced in Atlanta, where he was on the staff of Georgia Baptist Hospital; died in Daytona Beach March 4, aged 61, of bronchopneumonia and coronary artery disease.

McEachin, Ivan Benton, Newport News, Va.; Howard University College of Medicine, Washington, D. C., 1925; died Nov. 5, aged 54, of malignant hypertension.

Madera, William Luther ⊕ Morgantown, W. Va.; Medical College of Virginia, Richmond, 1927; served during World War I; died in Washington, D. C., Feb. 11, aged 55, of coronary disease.

Mangano, James Lorito ⊕ Rochester, N. Y.; University of Buffalo School of Medicine, 1914; member of the American College of Chest Physicians; served during World War I; for many years associated with Park Avenue Hospital; physician at Monroe County Penitentiary; died in Strong Memorial Hospital Feb. 2, aged 64, of diabetes mellitus.

Marple, Festus Oval ⊕ Huntington, W. Va.; Eclectic Medical College, Cincinnati, 1911; past president of the Cabell County Medical Society; served during World War I; on the staffs of the Chesapeake and Ohio, Huntington Memorial, St. Mary's and Guthrie hospitals; died in Holston Valley Community Hospital in Kingsport, Tenn., Feb. 13, aged 66, of ruptured aneurysm of the abdominal aorta.

Marshall, Charles Jay ⊕ Binghamton, N. Y.; Syracuse University College of Medicine, 1924; specialist certified by the American Board of Obstetrics and Gynecology; consulting obstetrician, Ideal Hospital in Endicott and Charles S. Wilson Memorial Hospital in Johnson City; consulting gynecologist, Broome County Tuberculosis Hospital in Chenango Bridge; chief of obstetrics at Our Lady of Lourdes Memorial Hospital; died Dec. 15, aged 51, of coronary occlusion.

Mitchell, Ezra Jay, Brodhead, Wis.; Northwestern University Medical School, Chicago, 1903; served during World War I; died in Sarasota, Fla., Jan. 26, aged 79.

Monahan, John Ambrose ⊕ Clinton, Mass.; Tufts College Medical School, Boston, 1903; member of the American Academy of Ophthalmology and Otolaryngology; served as a member of the board of health; associated with Clinton Hospital of which he had been a trustee; affiliated with Massachusetts Eye and Ear Infirmary in Boston, Memorial Hospital in Ayer, Leominster (Mass.) Hospital and Marlborough Hospital in Marlboro; died Feb. 21, aged 73, of hypertensive heart disease.

Moore, Arthur Selwyn, Sarasota, Fla.; University of Michigan Homeopathic Medical School, Ann Arbor, 1901; fellow of the American Psychiatric Association and the American College of Hospital Administrators; served as consultant of the Associated Hospital Service of New York; served during World War I; for many years affiliated with the Middletown (N. Y.) State Homeopathic Hospital; first medical superintendent of the Elizabeth A. Horton Memorial Hospital in Middletown, N. Y.; died Feb. 9, aged 72, of chronic bronchitis and coronary insufficiency.

Moore, Burt A., Louisville, Ky.; University of Louisville Medical Department, 1907; died in Baptist Hospital Jan. 29, aged 67, of cerebrovascular accident and hypertension.

Morton, Goodridge Venable, Fort Worth, Texas; Fort Worth School of Medicine, Medical Department of Fort Worth University, 1897; member of the American Medical Association; on the staffs of St. Joseph's, All Saints, and W. I. Cook Memorial hospitals; died in Harris Hospital Feb. 28, aged 78, of esophageal diverticulum.

Mowry, Charles, Convoy, Ohio; University of Wooster Medical Department, Cleveland, 1903; member of the American Medical Association; on the staff of Van Wert County Hospital in Van Wert, where he died Jan. 25, aged 76.

Nawrocki, Joseph F. J., St. Louis; St. Louis University School of Medicine, 1906; member of the American Medical Association; on the courtesy staff, department of general practice, De Paul Hospital, where he died Feb. 12, aged 69, of carcinoma of the urinary bladder.

Nichols, Clay Sr., ⊕ Luling, Texas; Medical Department of Tulane University of Louisiana, New Orleans, 1890; past president of the Caldwell County Medical Society; past president of the school board; died Feb. 29, aged 84, of coronary thrombosis.

Nichols, Thomas Lomax, Louisville, Ky.; Meharry Medical College, Nashville, Tenn., 1918; served as a member of the Louisville and Jefferson County Health Board; died Jan. 16, aged 61.

Olson, Olof Alfred, Rockford, Ill.; Hering Medical College, Chicago, 1908; member of the American Medical Association; formerly on the staff of St. Anthony's Hospital; died Feb. 27, aged 81, of coronary occlusion.

Ormsby, Floyd Edwin, Dallas, Texas; Southwestern University Medical College, Dallas, 1911; member of the American Medical Association; died in Methodist Hospital Feb. 24, aged 67.

Owens, William Irvine ⊕ Pulaski, Va.; Medical College of Virginia, Richmond, 1923; died in Lewis Gale Hospital, Roanoke, Feb. 23, aged 55, of cardiovascular renal disease.

Pack, Seba Egbert, Louisville, Ky.; University of West Tennessee College of Medicine and Surgery, Memphis, 1915; served in France during World War I; died Feb. 2, aged 65.

Perkins, Carter Constantine ⊕ Altadena, Calif.; St. Louis University School of Medicine, 1907; an Associate Fellow of the American Medical Association; member of the Colorado State Medical Society; formerly practiced in Denver, where he was associated with the health department, served as chief surgeon for the Denver division of the Burlington Railroad, and on the staffs of Children's and St. Luke's hospitals; died Feb. 6, aged 78, of coronary sclerosis.

Plunkett, John Horace, Wagoner, Okla.; Vanderbilt University School of Medicine, Nashville, Tenn., 1912; member of the American Medical Association; died Feb. 4, aged 77, of a heart attack.

Putts, Benjamin Swayne, Fort Lauderdale, Fla.; Johns Hopkins University School of Medicine, Baltimore, 1906; specialist certified by the American Board of Radiology; member of the American Roentgen Ray Society, Radiological Society of North America, and the American College of Radiology; formerly practiced in Erie, Pa., where he was on the staffs of the Hamot and St. Vincent's hospitals; died in Broward General Hospital Jan. 31, aged 69, of uremia.

Quick, James B., Laurium, Mich.; Northwestern University Medical School, Chicago, 1901; member of the American Medical Association; on the staff of the Calumet Public Hospital; died in Newberry Jan. 25, aged 90, of arteriosclerosis.

Quigley, John Scott, Oakland, Calif.; Stanford University School of Medicine, San Francisco, 1933; for many years medical consultant for the Alameda High School football team; served during World War II; died Feb. 25, aged 48.

Ransom, Edward Madison ⊕ Minot, N. D.; University of Minnesota College of Medicine and Surgery, Minneapolis, 1904; member of the Central Association of Obstetricians and Gynecologists; specialist certified by the American Board of Obstetrics and Gynecology; on the staff of Trinity Hospital, where he died Nov. 17, aged 69, of cerebral hemorrhage.

Reilly, Thomas Edward, Marlboro, Mass.; Dartmouth Medical School, Hanover, N. H., 1910; on the staff of the Marlboro Hospital; died Feb. 27, aged 67, of cerebral thrombosis and heart disease.

Reitz, George Ballantyne ⊕ Brooklyn; Long Island College Hospital, Brooklyn, 1913; member of the Industrial Medical Association; fellow of the American College of Surgeons; served during World War I; on the staff of St. John's Episcopal Hospital; on the courtesy staff of the Peck Memorial Hospital; died Feb. 23, aged 61, of hypertensive heart disease.

Risdon, James Waldo ⊕ Leavenworth, Kan.; University Medical College of Kansas City, Mo., 1905; on the staffs of St. John's and Cushing Memorial hospitals; died Jan. 30, aged 74, of coronary occlusion.

Riser, Roy Otis ⊕ Park Ridge, Ill.; University of Illinois College of Medicine, Chicago, 1931; specialist certified by the American Board of Ophthalmology; member of the American Academy of Ophthalmology and Otolaryngology; clinical associate professor of ophthalmology at his alma mater; served as vice president of the Chicago Ophthalmological Society; consultant in ophthalmology at St. Francis Hospital in Evanston, Ill.; affiliated with Children's Memorial and Research and Educational hospitals in Chicago; died Jan. 3, aged 45.

Robb, Claude Albert, Butler, Pa.; University of Pennsylvania School of Medicine, Philadelphia, 1910; fellow of the International College of Surgeons; on the staff of the Butler County Memorial Hospital; died Feb. 25, aged 66, of cerebral hemorrhage.

Robinson, Edith A. Carson ⊕ Pittsburgh; University of Pittsburgh School of Medicine, 1911; associated with the medical department of the board of public education; died Feb. 19, aged 66, of coronary occlusion.

Roop, Ernest P., New Market, Md.; Baltimore Medical College, 1903; member of the American Medical Association; formerly mayor of New Market; affiliated with Frederick (Md.) Memorial Hospital; died Feb. 3, aged 75, of injuries received in an automobile accident.

Royals, Thomas Edward ⊕ Meridian, Miss.; Tulane University of Louisiana, New Orleans, 1907; served during World War I; on the staff of St. Joseph Hospital where he died Feb. 19, aged 73, of carcinoma of the stomach.

Rozan, Milton Michael ⊕ Lansing, Mich.; University of Michigan Medical School, Ann Arbor, 1929; specialist certified by the American Board of Obstetrics and Gynecology; fellow of the American College of Surgeons; served during World War II; on the staffs of the St. Lawrence and Edward W. Sparrow hospitals; died Feb. 25, aged 49, of heart failure.

Sammons, George Whittenhal Hess, Farmington, N. M.; Rush Medical College, Chicago, 1904; died in Albuquerque, Feb. 5, aged 77.

Shumate, Thomas Edward, San Francisco; Cooper Medical College, San Francisco, 1894; also a druggist; member of the American Medical Association; served as police commissioner; for many years member of the board of trustees of St. Francis Hospital, where he died Feb. 27, aged 80, of coronary occlusion and diabetes mellitus.

Singer, Charles I. ⊕ New York; Deutsche Universität Medizinische Fakultät, Prague, 1921; died Dec. 10, aged 55.

Singer, Joseph Isaac ⊕ New York; New York University and Bellevue Hospital Medical College, New York, 1908; died in Palm Beach, Fla., Jan. 22, aged 69, of injuries received in an automobile accident.

Sloan, Clarence Reuben, Marietta, Ohio; Eclectic Medical Institute, Cincinnati, 1901; vice-president of the Washington County Medical Society, 1927, 1938, and 1940; died Jan. 15, aged 73.

Smith, Malcolm Kinmonth, Newport, R. I.; Cornell University Medical College, New York, 1910; retired assistant medical director of the Prudential Life Insurance Company; served during World War I; died Feb. 14, aged 72, of coronary thrombosis.

Steadman, Leonard Somerville, Junction City, Kan.; University Medical College of Kansas City, Mo., 1896; member of the American Medical Association; served as health officer of Geary County; died recently, aged 80, of coronary occlusion.

Van Ness, J. Howard, Allegan, Mich.; Dearborn Medical College, Chicago, 1905; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1906; member of the American Medical Association; died in Miami, Fla., recently, aged 79, of acute coronary thrombosis.

Vines, J. B., Bessemer, Ala. (licensed in Alabama, year unknown); died Jan. 25, aged 79, of arteriosclerosis.

Ware, Sara Jane Williams, New Rochelle, N. Y.; Woman's Medical College of Pennsylvania, Philadelphia, 1890; died in New Rochelle Hospital Feb. 10, aged 91, of coronary occlusion and coronary arteriosclerosis.

Wilson, James Iradel, Ochlochnee, Ga.; University of Georgia Medical Department, Augusta, 1891; died Jan. 29, aged 87, of uremia.

Wood, Nathaniel Knight ⊕ Cambridge, Mass.; Harvard Medical School, Boston, 1901; member of the American Clinical and Climatological Association; on the board of directors for many years and president at time of his death of the Boston Tuberculosis Association; served on the staffs of Boston City, Boston Lying-In, Carney, Boston Consumptive and Peter Brigham hospitals and Boston Dispensary, all in Boston, died Jan. 3, aged 75, of coronary thrombosis.

DIED WHILE IN MILITARY SERVICE

Hines, Clifford Gentner ⊕ Captain, U. S. Navy, Washington, D. C.; born in Washington, D. C., June 3, 1894; George Washington University School of Medicine, Washington, 1917; on completion of his internship at Emergency Hospital, Washington, D. C., was commissioned a lieutenant (jg) in the Naval Reserve, and transferred to the regular Navy in 1921; advanced to the rank of captain on June 16, 1942; served in the Washington, D. C., area at the Naval Medical School, Naval Dispensary, and, following cruises on the USS Alabama, at the Naval Hospital until the spring of 1923; served for two years at the Naval Station, St. Thomas, Virgin Islands; in 1925 returned to the Naval Hospital, Washington, D. C., for duty and a postgraduate course in psychiatry at St. Elizabeth's Hospital; following service in the Philippine Islands and with the Asiatic Fleet, was transferred to the USS Guam, where he served as senior medical officer; served at Pearl Harbor, Hawaii, then became chief of psychiatric service of the Naval Hospital, Mare Island, Calif.; later served in the same capacity in the Naval Hospital, Philadelphia, and at the Naval Prison, Portsmouth, N. H., until 1946; then was attached to the executive office, Secretary of the Navy; served as commanding officer, Naval Hospital, Coco Solo, Canal Zone, and on return to the United States assumed similar duties at the Naval Hospital, Annapolis, Md.; a member of the Medical Society of George Washington University, Association of Military Surgeons of the United States, Maryland Mental Hygiene Society, Maryland Society for Medical Research, Panama Canal Natural History Society, and American Association for the Advancement of Science; on the staff of St. Elizabeth's Hospital; was awarded the Yangtze Service Medal, the American Defense Service Medal with star, and the World War II Victory Medal; died at his home in Arlington, Va., March 2, aged 57, of coronary insufficiency.

Wesolowski, Louis Anthony, Philadelphia; Hahnemann Medical College and Hospital of Philadelphia, 1947; member of the American Medical Association; lieutenant in the Medical Corps of the U. S. Naval Reserve; died in the Naval Hospital, San Diego, Feb. 16, aged 29, of coronary thrombosis.

GOVERNMENT SERVICES

ARMY

ROTC Students in Summer Training at Army Hospitals.—More than 1,500 members of the Reserve Officers' Training Corps at medical, dental, veterinary, and pharmacy schools throughout the country will participate in professional and field training this summer at nine Army medical installations, the Army has announced. Except for last year's class, the group is the largest to take summer training since the establishment of the Army Medical Service ROTC program.

Six weeks' training in field medicine and clinical practice, beginning June 14 and July 26, will be given at the following Army hospitals to medical and dental ROTC students who have served a year's active duty in the armed forces: Brooke, Fort Sam Houston, Texas; Walter Reed, Washington, D. C.; Fitzsimons, Denver; Letterman, San Francisco; Percy Jones, Battle Creek, Mich.; and Valley Forge, Phoenixville, Pa. In addition, Fitzsimons has scheduled a special six week camp beginning May 12 for 22 medical students unable to attend either of the regular classes. Madigan Army Hospital, Tacoma, Wash., will train only one class beginning July 26.

ROTC enrollees without previous military service will receive instruction, also beginning June 14 and July 26, at U. S. Army hospitals at Fort Benning, Ga., and Fort Bragg, N. C. They will divide their time equally between field training and clinical clerkship work in the hospital, whereas students with prior service spend only two weeks in the field and four weeks in professional activities.

Forty-eight medical schools and 18 dental schools in the United States will send ROTC units to this summer's encampments. The 150 veterinary students, drawn from six institutions, and 100 pharmacy students, from four schools of pharmacy, will begin their six week training at Brooke Army Medical Center on June 21. ROTC members taking part in the exercises include third year students and some seniors scheduled to be graduated during the early part of next year.

Medical ROTC members are granted Reserve commissions as first lieutenants in the Medical Corps on graduation but are assured of at least one year's civilian internship before being called to active duty unless selected for a military internship. Similarly, dental and veterinary graduates who take commissions will not be immediately ordered to active duty unless their status under Public Law 779 makes them liable for such a call.

NAVY

Training Courses for Reserve Officers.—Volunteer Naval Reserve Medical Department officers may attend, on active duty orders, the following training courses during the fiscal year that begins July 1. Acceptance of orders to attend these courses of instruction will not in any way increase the possibility of their being involuntarily recalled to active service.

A one-week course, convening on Aug. 4, 1952; Nov. 17, 1952; and March 16, 1953, at the Naval Medical School, Bethesda, Md. Volunteer Naval Reserve Medical Department officers who reside in the 1st, 3rd, 4th, 5th, 6th, 8th, and 9th Naval Districts and the Potomac River Naval Command may apply to the commandant of their respective district for orders to attend. The course will present problems likely to be confronted and techniques to be employed by medical department officers in the field of radiological activity that are not available to them in their civilian capacity. A similar course will be convened at the Naval Station, Treasure Island, San Francisco, on March 2, 1953, for volunteer Naval Reserve Medical Department officers who reside in the 11th, 12th, and 13th Naval Districts. Interested officers may apply to their respective Commandants for orders to attend the course to be given at San Francisco.

Amphibious Medicine: A course convening on July 7, 1952; Oct. 6, 1952; and April 6, 1953, at the Naval Amphibious Base, Little Creek, Va. All volunteer naval reserve medical department officers, except nurse corps officers, are eligible. Those residing in the 1st, 3rd, 4th, 5th, 6th, 8th, and 9th Naval Districts and the Potomac River Naval Command may request orders to attend these courses from the commandant of their respective district. The course will consist of lectures, training films, demonstrations, and practical exercises to familiarize Medical Department officers with the nature of the medical service provided in amphibious operations.

Malariology and Insect Control: Courses will convene on the first and third Wednesday of each month during the fiscal year 1953 at the Naval Air Station, Jacksonville, Fla. The course provides information and techniques to be employed in insect control and practical field experience.

Probationary (Medical) Training: This two-week training course will be conducted during the months of July, August, and September, 1952, in the professional services at various naval hospitals. Only ensigns probationary (medical) are eligible for this training. Applications should be submitted to respective commandants.

Research for Ensign Probationary (Medical): This is a new training course to acquaint the trainee with naval medical research as a whole, and a review in detail of the research program of the institution at which the trainee is on training duty. The trainee will spend a part of each day in each of the research departments, following which he will serve as an assistant in actual laboratory research work on one specific project underway at the time. Ensigns probationary (medical) who have successfully completed first year of medical school and have manifested an interest in medical research are eligible for this training.

AIR FORCE

Flying Doctors.—A group of young medical officers from the School of Aviation Medicine have reported to Goodfellow Air Force Base in San Angelo, Texas, for eight weeks of flight instruction as part of their basic course in airmedicine.

The 20 officers will fly and study along with air cadets. They will get 45 hours of dual instruction in single-engine T-6 trainers and two hours in twin-engine TB-25s. In addition, they will spend 10 hours under the hood of a Link trainer, learning to fly by instruments, and 132 hours in class rooms, studying navigation, engine design, electronics, and other nonanatomical subjects.

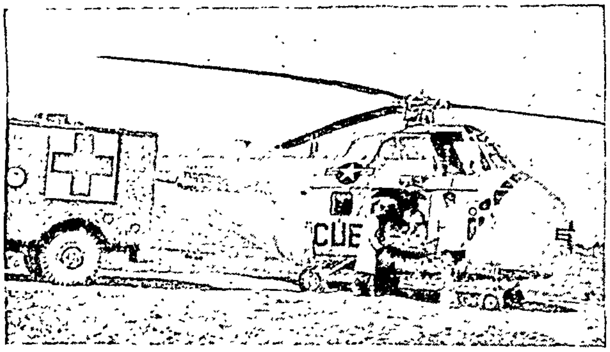
The basic course in aviation medicine, for which these twenty men were carefully selected, is limited to regular Air Force medical officers and to reserves who volunteer for five years of active duty. It is designed to qualify them as specialists in the aeromedical field. They receive a year of study at the School of Aviation Medicine's Randolph Field headquarters, climaxed by this eight-week taste of pilot training. Then they take another year of postgraduate work at a civilian medical college.

Johns Hopkins University in Baltimore is the first nonmilitary school to give this specialized aeromedical instruction. After these two years of formal teaching, in the course of which they are awarded flight surgeons' wings, the doctors spend three more years with Air Force units in the field. With this experience, they are eligible for certification in the specialty of aviation medicine.

Specialty Consultants Named.—Seven Air Force medical officers have been named specialty consultants for the Air Force Medical Service, it was disclosed April 25 by Brig. Gen. Earl Maxwell (MC) USAF, director of professional services for the Air Force Surgeon General. General Maxwell himself has been designated as consultant in ophthalmology. The other officers are: Col. William D. Preston, consultant in internal medicine; Col. Oscar S. Reeder, consultant in orthopedic surgery; Col. John A. Schindler, consultant in urology; Col. Ralph M. Thompson, consultant in pathology; Lt. Col. Carlos C. Alden Jr., and Capt. Edward J. Kollar Jr., consultants in neuropsychiatry. Colonel Schindler is chief of the physical standards division, directorate of professional services. Colonel Thompson is deputy director of the Armed Forces Institute of Pathology. Colonel Reeder heads the new group that replaces the former medical consultants division in the directorate of professional services. Colonel Preston, Colonel Alden, and Captain Kollar are assigned to the consultants group as primary duty.

Helicopter Men Win Trophy.—The Third Air Rescue outfit has made many life-saving missions into the forward area in Korea since the beginning of the conflict. In a matter of minutes, a downed pilot in Korea is admitted to the patient compartment of a helicopter, which then rises over the front lines. The pilot guides the helicopter between mountains while an aeromedical specialist administers treatment to the injured person. The ambucopter settles on the heliport of the Air Force's 67th Medical Group and the staff of the USAF Hospital, having been previously alerted, has medical facilities ready for treatment of the incoming patient. The complete frontline evacuation operation has not taken more than 40 minutes.

The rotary-wing aircraft received fitting tribute recently when the Collier Trophy aeronautical award was presented to "the men who make this wonderful machine and to those who have used it to save so many lives."



Ambucopter Brings in Casualties

Personal.—Col. Fratis L. Duff, (MC) USAF, addressed the graduating class at the Harvard Post Graduate School of Public Health on April 18. His talk concerned respiratory diseases of the Air Force, streptococcal disease, and rheumatic fever. The military preventive medicine course, before which he spoke, is primarily for students from the military services and those in the reserve corps or with other responsibilities of civil and military defense nature. Colonel Duff is chief of the preventive medicine division in the Office of USAF Surgeon General. He delivered the address at the invitation of Dr. James Stevens Simmons, brigadier general, USA (ret.), dean of the Harvard School of Public Health.

ATOMIC ENERGY COMMISSION

Industrial Hygiene Training Program.—The Atomic Energy Commission has inaugurated a one year fellowship training program for industrial hygienists, starting in the fall of 1952. If qualified candidates can be obtained, up to four will be selected for one school year of academic training. The stipend for the industrial hygiene fellows would be: $1,500 per annum if single; an additional $500 if married and $250 additional for each of two dependent children. If the fellow has completed one or more years of graduate work in a related field, he will be allowed $200 additional. Candidates will be selected by a committee headed by H. F. Schulte, group leader, industrial hygiene group, Los Alamos Scientific Laboratory, Los Alamos, N. M. All candidates would be required to have a security investigation before being appointed. The program will be administered by the Atomic Energy Project, School of Medicine and Dentistry, University of Rochester, Rochester, N. Y. Applicants must have a degree in engineering (preferably chemical), chemistry, or physics. Application blanks may be obtained from Mr. Merril Eisenbud, New York Operations Office, Atomic Energy Commission, P. O. Box 30, Ansonia Station, New York 23, N. Y.

Dr. Bugher Succeeds Dr. Warren.—The resignation of Dr. Shields Warren as director of the Atomic Energy Commission's division of biology and medicine is effective June 30. The appointment of Dr. John C. Bugher as his successor has been announced. Dr. Bugher, deputy director of the biology and medicine division, has been a member of the International Health Division of the Rockefeller Foundation since 1938. He has engaged in research and control of infectious diseases, including work on yellow fever in South America and Africa and the control of other tropical diseases. Born in Indiana in 1901, Dr. Bugher was graduated from the University of Michigan. He was assistant in bacteriology at Michigan, instructor and assistant professor of bacteriology at the medical school, and public health director for South Haven, Mich., from 1926 to 1928. He is a member of the Society of Experimental Pathology, Association of Pathology and Bacteriology, Association of Cancer Research, Society of Clinical Pathology, American Medical Association, and the American Society of Tropical Medicine and the Royal Society of Tropical Medicine.

MISCELLANEOUS

624 Graduate Fellowships Awarded.—The National Science Foundation, 2144 California St., N. W., Washington 25, D. C., has awarded 624 graduate fellowships in the natural sciences for the academic year 1952-53. The successful fellows were selected from about 3,000 applications from all parts of the United States and its possessions and from American citizens abroad. The list of awards includes 569 predoctoral fellows and 55 postdoctoral fellows. All fellows were selected by the foundation on the basis of ability, with awards made in cases of substantially equal ability so as to result in a wide geographical distribution.

A total of 169 (27%) of the awards were made to first year graduate students. This is a sharp departure from previous federal fellowship programs in which the major emphasis has been on awards to advanced students. The foundation hopes through this policy to encourage college graduates having scientific aptitude to continue with advanced studies in preparation for careers in scientific research and teaching. A total of 170 of the awards were made to second year graduate students, 230 to advanced predoctoral students, and 55 to postdoctoral fellows. The largest group of fellowships, 158, were awarded in the biological sciences. In other fields the number of awards were: chemistry, 140; physics, 137; engineering, 75; mathematics, 62; earth sciences, 36; agriculture, 7; astronomy, 6; and anthropology, 3.

Fellows may pursue their training at accredited non-profit institutions of higher education in the United States or similar institutions abroad approved by the foundation. Before he may begin his fellowship the fellow must show that he will be accepted by the institution in which he plans to study. Stipends vary with the academic status of the fellows. First year fellows will receive a basic stipend of $1,400; second year, $1,600; advanced predoctoral, $1,700; and postdoctoral, $3,000 per year. Second year, advanced predoctoral and postdoctoral fellows will receive additional allowances for wives and children. Normal tuition and laboratory fees will be paid by the foundation, and limited allowances to aid in defraying costs of travel will be provided.

National Science Foundation fellows will be expected to devote full time to advanced scientific study for the full tenure of the fellowship. The results of research carried out by a fellow during his training may be made available to the public without restriction, except as is required in the interest of national security. It is expected that the announcement concerning National Science Foundation Graduate Fellowships for 1953-54 will be made about Oct. 1, 1952. Application forms will not be available until that time.

FOREIGN LETTERS

AUSTRALIA

"Free" Medicine Costs Soar.—Since September, 1950, the commonwealth government has allocated a pharmaceutical benefit to every person in Australia. The list of drugs available is restricted to drugs that are designated as "life-saving"; the full details were given in the letter from Australia dated Sept. 20, 1950. This part of the scheme was estimated to cost £3,000,000 ($6,500,000). In the first year of operation, there was an expenditure of £5,000,000 ($11,000,000), and, at the present rate of expenditure, it is estimated that this year the cost will be £7,000,000 ($15,000,000). This is almost £1, or more than $2, per person in Australia.

The Minister of Health, Sir Earle Page, F.R.C.S., is naturally disturbed at this increase, and he ascribes part of the rise to the prescribing of the more costly drugs for conditions that are clinically unlikely to show improvement by their use. Consequently, a directive has been issued limiting the use of the more expensive drugs to specified conditions. Aureomycin is to be used only for acute and subacute bacterial endocarditis, Streptococcus faecalis pneumonia that has not responded to penicillin or sulfonamide therapy, and urinary tract infections caused by gram-negative organisms. Chloramphenicol is now limited to treatment of patients with typhoid fever, brucellosis, typhus and other rickettsial diseases, influenzal meningitis, granuloma inguinale, lymphogranuloma venereum, diseases caused by Hemophilus pertussis or H. influenza, acute laryngotracheal bronchitis, salmonellosis, and severe gastroenteritis in children. Dihydrostreptomycin can only be used in cases of H. influenza, chancroid, Friedländer's bacillus pneumonia, acute tuberculosis, salmonellosis, bacillary dysentery, tularemia, and surgical conditions of the bowel. Streptomycin is restricted to use for H. influenza, chancroid, Friedländer's bacillus pneumonia, acute tuberculosis, salmonellosis, bacillary dysentery, tularemia, and surgical conditions of the bowel. Diethylstilbestrol (stilbestrol) is to be used only for carcinoma of the prostate and testosterone propionate only for mammary carcinoma. Phenindamine tartrate is restricted to use for Parkinson's disease, and the quinine salts are restricted to use in malaria. Every prescription for these drugs must be endorsed in accordance with regulation 14A. For some time, there have been limitations on the quantity of any one drug prescribed during one day. Protein hydrolysates, for example, are limited to 1 liter per day. As most patients require continuous intravenous protein therapy for over a period of several days and the usual rate of infusion is 2 to 2½ liters per day, the patient must pay for the quantity in excess of 1 liter each day.

Medical Service for Pensioners.—For the last 12 months, all persons in Australia who receive an old age or invalid pension are entitled to "free" medical attention in their homes or at a physician's office. They have a choice of physicians. The patient signs a form on the strength of which the physician can collect 75% of the normal fee. The pensioner is also entitled to a wide range of pharmaceutical benefits, covering almost all his needs. These benefits also apply to the pensioner's dependents.

This service has considerably reduced the attendance of pensioners as outpatients at public hospitals and has reduced by 6% the number of persons applying to be inpatients. About 570,000 pensioners in Australia (6% of the population) and their dependents are eligible for this service.

Prepayment Medical Plan.—The commonwealth government subsidizes approved organizations that provide prepayment insurance policies. As a result, many persons are contributing, the total number at present exceeding 1,000,000, who, with their dependents, represent more than 30% of the total population of Australia. The patient, under this plan, has a choice of physicians and private hospitals.

BRAZIL

Campaign Against Filariasis.—Drs. René Rachou and Leonid. M. Deane, of the malaria division of the National Health D partment, reported to the Brazilian Society of Hygiene the fi steps taken in the city of Belem, Pará, to fight the infectio caused by Wuchereria bancrofti, the commonest filaria in Brazil. This work was done to comply with the directive given by the minister of health in August of last year stating that the division would undertake the study of the incidence of filariasis in Brazil and promote adequate preventive measures where the infection is known to exist or will be discovered. The malaria division, for a few years, has been spraying millions of houses with DDT against anophelines and so is well equipped to take up a similar task against other arthropods, as it is already doing to fight the reduviid bugs, which are vectors of American trypanosomiasis (Chagas' disease).

Of the eight known species of human filariasis, three have already been recognized in the equatorial and tropical sections of Brazil, namely, Dracunculus medinensis, D. bancrofti, and Mansonella ozzardi. The first one, imported from Africa through Negro slaves during the 17th and 18th centuries, found susceptible intermediate hosts in Bahia, where a few small foci were formed. Those small foci disappeared spontaneously, without any special measures, owing, it seems, to prolonged droughts, which extinguished the water collections. For many years, W. bancrofti has been identified in many localities of the tropical sections of the country. M. ozzardi, recognized for the first time in Manaus, Amazonas, by Dr. Maria Deane in 1949, was later found in several localities on the upper Amazon River. Little is known about the pathogenicity of the latter species, but W. bancrofti is a species of proved pathogenic action. The infection by W. bancrofti, well recognized as existent in several states of Brazil, is known only in connection with its clinical and therapeutic aspects. Our knowledge about the public health significance of bancroftiasis is scant.

Previous knowledge of bancroftiasis indicated Belem (population 250,000), at the mouth of the Amazon River, as a locality where the disease is important, Manaus (population 120,000), on the upper Amazon River, as a city with a low incidence. In some sections of the city of Salvador (population 380,000), on the eastern seaboard of Bahia, the incidence of bancroftiasis is relatively important. These data were derived, for Belem, in a survey by Drs. Causey, L. Deane, Costa, and M. Deane, in 1945, in which 5,000 persons were examined, with the disclosure of indexes of microfilaremia, filariasis, and elephantiasis of 10.8%, 12.0%, and 1.3 %, respectively. The principal vector was found to be Culex fatigans (11% of natural infestation), Anopheles tarsimaculatus (0.6%) and Anopheles darlingi (0.5%) being secondary vectors. In Manaus in 1948, Maria Deane examined 2,405 persons, 0.2% and 0.6% of whom were found to present W. bancrofti and M. ozzardi, respectively, in the blood. For better knowledge of the distribution of filariasis in Brazil, the malaria division has planned surveys in hundreds of localities of several states and territories. They plan to begin with the extreme northern sections of the country, near the borders of Peru, Colombia, Venezuela, and the Guianas. A special, intensive course was given during January, 1952, at Belem, to 15 entomologic technicians of the division.

At the same time, the malaria division prepared the plan of the first campaign, which has already begun in Belem, where it is conservatively estimated that 30,000 residents are infected by filariae. As the main course of action of the campaign, the spraying with residual insecticides is being performed in 43,000 houses, in order to attack C. fatigans in its adult stage. The fatigans mosquito is less sensitive to DDT than the anophelines and is supposed to easily acquire a strong resistance to the poison. This led to the choice of BHC, or benzene hexachloride, as the residual poison to be used, on the theoretical basis of 300 mg. of its gamma-isomer per square meter. At Belem, the 43,000 dwellings will be sprayed four times a year, which will

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The items in these letters are contributed by regular correspondents in the various foreign countries.

make a total of 172,000 applications of insecticides per year, using about 12,900 kg. of BHC. As a complementary measure, the known carriers of microfilariae will be treated with hetrazan, a commercial brand of 1-diethylcarbonyl-4-methylpiperazine, with the hope of bringing the number of carriers well below the minimum necessary to the infestation of the vectors. This drug has the advantages of being well tolerated in therapeutic dosages and easily taken by the oral route.

As an experimental measure, there are also plans to carry out control measures against the larva of C. fatigans in about 10% of the total area, in order to ascertain the efficiency of the domiciliary disinsectization, and eventually to decide whether it would be necessary to use the two methods combined to obtain complete control of bancroftiasis.

ITALY

Medicosurgical Society.—The Calabrian Medicosurgical Society held a meeting in Reggio Calabria, under the chairmanship of Professor Salvadori. Dr. Ferrara discussed the modern aspects of fibrinous pneumonia, advancing a new concept on the mechanism of its resolution. According to the speaker, the process of resolution is not connected with the granulocyte autolysis of the exudate, as is generally believed, but with the action of a specific fibrinolytic enzyme. This is, as a rule, contained in the circulating blood and in the pulmonary tissue when the blood again flows into the pulmonary area, which has been ischemic because of hepatization.

Dr. Barone reported on "giganto-follicular" splenomegaly and described one case; he considered this morbid manifestation a genuine splenic form of giant follicular lymphoma (Brill-Symmers disease). He discussed the hypotheses advanced to explain the pathogenesis of this obscure disease, i. e., the hyperplastic concept based on toxins and the neoplastic concept. The afore-mentioned case was diagnosed as nodular reticuloendotheliosis of the spleen associated with protein thesaurosis.

Dr. Timpano discussed two subjects of a practical nature, the pneumothorax not detected by roentgenographic investigation and the therapeutic pneumothorax instituted in the outpatient medical clinic. He pointed out that there are cases of pneumothorax in which the gas is not visible on the screen and during radiography, even after several months of treatment. Because, in these cases, an exact idea of the pneumothorax efficiency cannot be obtained, the physician, who does not have a guide in the procedure to follow, is compelled to depend on manometric pressures and on therapeutic responses. There are various causes for this exceptional roentgenographic behavior. Among these is the varying density or the varying thickness of the pleurae compared with the density of the pulmonary parenchyma, the adhering fibers, a "partial" pneumothorax, and a "blocked" pneumothorax. In these cases, one must be cautious in judging the surgeon and denying the presence of a pneumothorax just because the gas is not visible on the screen. In these patients, it is not wise to apply excessive pressure just because one wants to see the gas. Dr. Timpano then reported on his personal experience with 306 patients in whom he began pneumothorax in the outpatient medical clinic. He arrived at the following conclusions; the beginning of pneumothorax in the outpatient medical clinic does not cause, in general, severe reactions, even in patients who walk home or take the train or bus. The main thing is to know how to select the patients. In general, patients with initial exudative forms or with confined bronchopneumonic forms, who do not have abnormal or subfebrile temperature, are indicated. The reasons for beginning pneumothorax in the outpatient medical clinic is the patients' financial status or the scarcity of hospital beds.

In the discussion that followed, Dr. Galifi pointed out that in patients in whom a pneumothorax is not detected by roentgenograms, the phenomenon is linked to a process of fibrinous pachypleuritis of the parietal pleura that does not involve the visceral pleura. The layer of parietal fibrin disguises the pneumothorax chamber; in these cases, it is necessary to search for the margin of pulmonary compression in oblique projections. Dr. Romeo called attention to the opaque pneumothorax described by Torelli, who explains it as a modification of the normal radiological finding, consisting of an inversion of the ratio between the excessive clearness of the pneumothoracic bolus and the pulmonary opacity. Dr. Barbieri emphasized the brilliant results that may be obtained in nursing infants with bilateral hypotensive pneumothorax.

Dr. Geraci reported on his experiments in treating trachoma and other infections of the eyes with terramycin. Local application of an ointment containing terramycin in doses of 1% or 2% was carried out in 20 patients. Clinical and therapeutic results were encouraging. Dr. Cinelli reported on a case of tularemia observed in a young woman who was bitten by a dog (second carrier) that had eaten a quail. There was an ulceroglandular lesion on the bitten hand, and subsequent enlargement of the epitrochlear and axillary lymph nodes. A serologic test was positive on the fifth day, and a tularin reaction was positive on the third day. After diagnosis was made, the disease was successfully treated with chloramphenicol (chloromycetin®) in doses of 3 gm. daily.

Drs. Negri and Pecchiai studied bone marrow smears in a group of children with acute leukemia. On the basis of the results obtained employing various histological techniques, the speakers concluded that it is impossible to classify the cells of acute leukemia of children with any element of the normal hematic series. Therefore, they propose calling the cells leukoblasts, new cells that have gone astray during their metabolism. This is demonstrated by the high content of ribonucleic acid and by the accumulation of glucidic masses with a positive reaction to Schiff's test. Dr. Pecchiai discussed the concept of "soiling of the protein plasma" that was recently introduced by Poli and is characterized by an increase in the iontophoretic tracing of the alpha and beta fractions. This increase is almost always associated with neutrophilic leukocytosis with increased destruction of granulocytes.

Dr. Carere-Comes reported on vitamin B_{13}, a new antianemic factor that he isolated and that proved to have a definite activating action on glycolysis in vivo as well as in vitro, in the treatment of patients with moderate diabetes.

LONDON

Notable Pediatric Centenary.—Great Ormond Street is one of the drearier of London's streets, but it is probably one of the best known throughout the world—and certainly in pediatric circles, where it is synonymous with the world-famous children's hospital it houses, the Hospital for Sick Children. In February the hospital attained its centenary; it was opened on St. Valentine's Day, 1852. It was the first children's hospital in the British Isles, and the credit for its founding goes to Dr. Charles West. The task was not an easy one, and many reasons were advanced why a hospital for children was undesirable. West, however, persisted and finally gained the influential support he required: a contribution from Queen Victoria who became the first patron, an article supporting the scheme by Charles Dickens in "Household Words," and the acceptance of the presidency by Lord Shaftesbury. The first site of the hospital was 49 Great Ormond Street, a 17th century house formerly occupied by Dr. Mead, physician to Queen Anne. When the hospital was opened, it had 10 beds. In view of the subsequent history of this great institution it is interesting to note the original aims of the hospital: (1) to provide for the reception, maintenance, and medical treatment of the children of the poor during sickness and to furnish advice to the mothers of those who were not admitted; (2) to promote the advancement of medical science with reference to the diseases of childhood and to provide efficient instruction of students in these diseases; and (3) to disseminate among all classes, but chiefly among the poor, a better acquaintance with the management of infants and children during illness by employing the hospital as a school for the education and training of women in children's nursing.

After a slow start the hospital rapidly expanded. In 1858 Charles Dickens again came to the help of the hospital by presiding over a festival dinner, which raised sufficient funds to allow the purchase of adjoining property for expansion. In 1877 a completely new hospital, containing 120 beds, was opened, and 10 years later, to celebrate the jubilee of Queen Victoria, the children of the empire subscribed money for the erection of a new wing. The main block of the present building was opened by King George VI and his consort in 1938. Further building was delayed by the outbreak of World War II, but it is hoped that the foundation stone of a new outpatient department will be laid later this year. Also included in plans for the future are buildings for the Institute of Child Health, which was founded after the 1939 to 1945 war and which, under the inspiring leadership of Prof. Alan Moncrieff, the first incumbent of the chair of child health in the University of London, has firmly consolidated the position of the hospital as the leading center of postgraduate teaching in pediatrics in the country.

Great Ormond Street is synonymous with all that is outstanding in the history of pediatrics in this country during the last hundred years. The members of its staff include some of the great names in pediatrics: Barlow, Still, and Hutchison. To amplify this aspect of the hospital is unnecessary for American readers, but brief reference may be made to Sir James Barrie's association with it, as described recently by Lord Macmillan, a former chairman of the hospital, in a letter to *The Times.* Lord Macmillan was chairman when Barrie presented all his copyrights in "Peter Pan" to the hospital. Barrie insisted that "Peter Pan" "must really come in person to the hospital," and it was therefore arranged that a performance of the play should be given in one of the wards. The cast for the occasion was a brilliant one: Sir Gerald du Maurier, Miss Marie Lohr, and Miss Jean Forbes-Robertson as Peter Pan. Barrie himself was present, but at the end of the performance he could not be found. Immediate search was made, and "at last he was discovered all by himself in one of the wards, talking to the little patients who had not been able to see the show."

Leonardo da Vinci Quincentenary Exhibition.—The quincentenary of the birth of Leonardo da Vinci is being celebrated in London by a fascinating exhibition of his work at Burlington House. This has been arranged jointly by the Royal Academy of Arts and the Science Museum. The exhibition is divided into three parts: his drawings, copies of his drawings derived by his pupils from lost works, and his scientific work. This last category provides a fascinating survey of the great artist's scientific genius. Most of Leonardo's existing original anatomic manuscripts are in the royal library at Windsor, and many of them are on show in the exhibition. The greater number of these portray dissections of muscles and bones; all are highly artistic, and many are very accurate. It is in the drawings of the internal organs that one encounters a curious mixture of scientific observation and traditional belief. Thus, in the "female situs figure," original observation is shown as it is in the relative accuracy of the shape and size of the kidneys, liver, and spleen, but the ovaries are shown as being alongside the cervix and connected to it by a duct. Leonardo's mechanical ingenuity is well illustrated in the drawing of the ventricles of the brain as outlined in wax. These wax models were obtained by pouring molten wax into the ventricles, allowing it to harden, and then dissecting the brain. His drawing of "the child in the womb" shows that, differing from traditional authority, he appreciated that the human uterus contained a single cavity, but the placenta shows the scattered cotyledons of the cow. An accurate drawing of the maxillary sinus is of interest in view of the fact that it was not until 1651, that it was rediscovered by Highmore, a physician in Dorset, after whom it is still often referred to as the antrum of Highmore. Perhaps the most impressive of all his drawings are those of the heart; these demonstrate that Leonardo appreciated that the heart consisted of four main chambers and not two as tradition taught. Equally striking, however, is his detailed treatment of the aortic and tricuspid valves, and chordae tendineae and the moderator band.

Compulsory Use of Fireguards.—The Heating Appliances (Fireguards) Bill, which has government approval, has just received its second reading in the House of Commons. The bill would give power to the Home Secretary and the Secretary of State for Scotland to make regulations concerning standards of construction and fitting of fireguards for electric and gas fires and oil stoves. After a fixed date, it would be an offense to sell any of the appliances covered by the regulations unless they were adequately guarded according to the standards stated in the regulations. The British Standards Institution has already issued safety specifications for gas and electric fires. The only legislation that exists at the moment is under the Children and Young Persons Act of 1908. This deals with unguarded coal fires, but, under the act, it is not an offense for a fire to be without a guard unless a child is burned.

The "General Practitioner's Disease?"—According to a detailed statistical analysis published in the *British Medical Journal,* the probability that a male medical practitioner "under 45 years of age who had not yet been attacked by it will be attacked by clinical coronary heart disease (i. e., coronary thrombosis, acute myocardial infarction, angina pectoris) before he reaches 65 are about one in five, or 20 per cent. The chances that the individual practitioner under 45 years of age will die of it are about one in fourteen, or between 7.1 per cent and 7.5 per cent." These results are based on an analysis of the records of 6,000 male medical practitioners aged 35 to 64, members of an assurance society, who "held 'immediate' non-cancellable sickness insurance, providing benefit on receipt of a medical certificate, for periods of incapacity to work which last seven days or more." The society also has knowledge of all deaths of its members. The average annual incidence of first clinical attacks of coronary heart disease during 1947 to 1950 increased with age, from 2.2 per 1,000 at 40 to 44 years to 16.6 per 1,000 at 60 to 64 years. The coronary death rate during this period also increased with age, from 0.9 per 1,000 at 40 to 44 years to 7.4 per 1,000 at 60 to 64 years. Of the patients with "coronary thrombosis," 30% died during the first six days of the first attack, and another 8% died during the remainder of the first month, a total of 38%. Subsequently, the prognosis improved rapidly; 2% died during the remainder of the first year, and an average of about 2% died annually during the next six years. Of the patients who survived the first attack of "coronary thrombosis," about half had no further absence from work because of coronary heart disease (or its complications) that lasted as much as a week during the next six years. Of the patients with angina pectoris, 11% died during the five years from the onset; the prognosis for life being about the same as for those with "coronary thrombosis" who survive the first month. The incidence of coronary heart disease (standardized rate per 1,000 men aged 40 to 59) was 7.1 for general practitioners, 3.3 for other physicians, and 2.5 for a miscellaneous nonmedical group.

Tea Addiction.—In a debate in the House of Commons recently, one of the medical members of Parliament pointed out that, with an average consumption of 3 oz. of tea a week, the total national intake of pure caffeine is about 50 million pounds annually. Some persons consider 10 cups of tea a day as normal consumption. As there is about 1.5 grains (0.09 gm.) of caffeine in an average strong cup of tea, this means that these persons are taking 15 grains (0.97 gm.) of caffeine daily. The maximum medicinal dose of caffeine a day is 5 grains (0.32 gm.). He stated: "So it is apparent that some people who would never think of drinking beer intoxicate themselves by taking an excessive amount of caffeine through their tea. Then they pose before us as virtuous people, forgetting that they are the truest type of drug addicts because caffeine is a true cerebral stimulant, whereas the amount of alcohol in beer, lager beer and cider . . . is not stimulating and is really ultimately depressing."

Sir Charles Sherrington.—The death of Sir Charles Sherrington, at the ripe old age of 94, means the passing of the greatest neurophysiologist of his age and one who "in his retirement, with the pen of a poet and the brain of a scientist, earned the honourable title of the Philosopher of the Nervous System." It was in 1895 that he was appointed to his first chair, the chair of physiology in the University of Liverpool, and, in 1913, he accepted an invitation to the Waynflete chair of physiology at Oxford, where he remained until his retirement in 1936. The honors bestowed on him typified the outstanding position he occupied in the scientific world, honorary degrees from 22 universities, president of the Royal Society (1920-1925), a member of the Order of Merit (O.M.), and a Nobel Prize winner. His students are now leaders in their specialty in all parts of the world, and the United States has some of the most distinguished in John Fulton, Stanley Cobb, the Hoff brothers, and Derek Denny-Brown, to mention only a few. These, and many others, are a striking tribute to the great tradition built up by Sherrington in the sphere of neurophysiology, and it may well be that his final niche in the temple of time will be as "the philosopher of the nervous system." As is stated in *The Lancet:* "To Sherrington's years of research we owe a wealth of careful observation, elegant demonstration, and fruitful synthesis. To his years of reflection we owe his assessment of what remains unknown, and his assertion that mind remains apart—supreme and untouched. In his own words: "mind for anything perception can compass, goes therefore in our spatial world more ghostly than a ghost. Invisible, intangible, it is a thing not even of outline; it is not a 'thing.' It remains without sensual confirmation, and remains without it for ever. Stripped to nakedness there remains to it but itself. Desire, zest, truth, love, knowledge, 'values,' and, seeking metaphor to eke out expression, hell's depth and heaven's utmost height. Naked mind."

MEXICO

Correlation Between Liver Function Tests and Histological Changes of the Liver.—To study the relation between the anatomic lesion and the functional disturbances of the liver, Sepúlveda, Rojas, and Rivera, from the Hospital de Enfermedades de la Nutrición in Mexico City, selected 62 patients in whom liver biopsy was performed between May, 1949, and February, 1950. The histopathological pattern of the biopsy was compared with the results of the liver function tests done prior to the biopsy. Only patients with chronic liver disease were studied, and, according to the histopathological findings, the following classification was made: Laënnec's cirrhosis, 25; postnecrotic cirrhosis, 5; diffuse sclerosing hepatitis, 3; biliary cirrhosis, 2; cardiac cirrhosis, 1; and post-hepatic jaundice of benign origin, 4, of malignant origin, 1, secondary to brucellosis, 6, due to malnutrition, 7, and other forms, 8.

The severity of the hepatic lesion could not be accurately evaluated in numerical terms but only approximately estimated. The pathological specimens were sectioned at 5 μ and routinely stained with hematoxylin and eosin. In some cases other techniques were added: Río Ortega for collagen, sudan IV for lipids, Mallory's phloxine methylene blue to demonstrate more satisfactorily the alcoholic hyalin; Wilder for precollagen, and Perls' for ferric pigments.

The results of this study prove that there is no absolute correlation between the degrees of cellular damage and of functional disturbances that can be demonstrated by present techniques. This is especially true of the group with moderate changes. These observations agree with those of many other authors who have stated that it is possible to find variable degrees of functional disturbance in the presence of the same liver cell damage and vice versa; these results can be explained by the great functional reserve and regenerative power of the liver, which can compensate for the functional deficit and thus produce the apparent discordance between the anatomic picture, as judged by the liver biopsy, and the liver function, as determined by laboratory tests. It must be stated that this discordance does not imply lack of sensibility of the tests nor lack of specificity, as the morphological study is not the only basis by which hepatic changes can be determined. It is generally accepted that the study will not show a strict numerical evaluation but rather an estimative comparison and that new histochemical techniques will probably permit a better appraisal of the structural damage and establish its correlation with the functional disturbances.

It was noted that certain isolated tests were altered more in relation to the anatomic lesion than others, depending on the type and phase of the disease, not because they have greater sensibility, but because they have different mechanisms. The fact that bromsulfalein retention is extremely useful in evaluating the functional status of the liver has been confirmed in the present study in which the bromsulfalein test was the most concordant with the histological appearance.

The cholesterol esters of the serum were not altered in patients with mild histological changes, but they did vary with marked parenchymal damage. A persistently low level of the serum cholesterol esters was considered as a useful sign of poor prognosis in liver disease. To explain this, the hypothesis was offered that in mild cellular damage the substances that inactivate esterase, which in turn brings about the esterification of cholesterol, either are not formed or are found in small quantities.

No correlation was found between the prothrombin time and the degree of cellular damage. Prolonged prothrombin time values were frequently found in the absence of liver damage or biliary obstruction. In other cases, the test was within normal limits despite the evidence of cellular damage and hepatic dysfunction in other tests.

Minimum levels of direct serum bilirubin found in the majority of the patients did not correspond to the degree of cellular damage. It is certain that these results were due to the type of disease under study. In 81% of the cases with cellular damage, no direct serum bilirubin was found. It is possible that the explanation of this finding may be had in the ideas of Watson, who has insisted that bile regurgitation occurs through the bile capillaries rather than through the damaged hepatic cells. In this manner, direct bilirubin may be detected in the serum in the presence of normal or damaged liver cells. Watson has also indicated that frequently the lesion of the canaliculi cannot be demonstrated on a microscopic slide and that these are cases of increased permeability of the bile capillaries.

In the present study, the serum albumin level had little relation to the degree of cellular damage, and the correlation diminished as the anatomic lesion advanced, suggesting that a disturbance of the albumin synthesis occurs with minimal cellular damage, a fact already pointed out by Lichtman and ratified by Gray's electrophoretic studies; nevertheless, this disturbance did not increase in proportion to the anatomic lesion. This cannot be generalized in view of the fact that in acute virus hepatitis the serum albumin values, except in very severe cases, are only slightly altered.

It was found that tests with the serum globulins were among those that varied in direct relation to the hepatic lesion. This seems strange because the serum globulins have been considered to be substances formed by the reticuloendothelial system, which would indicate immunologic reactions; however, the frequency with which Kupffer's cells are damaged in hepatic disease must be considered. On the other hand, the histochemical studies of Szanto have demonstrated the presence of large quantities of ribonucleic acid in these cells in the course of liver disease, a fact that indicates that proteins are being produced.

Knowledge of the prominence and mobilization of Kupffer's cells was regarded as useful data for evaluating the anatomic lesions. Thus, in the presence of hyperplasia of the reticuloendothelial system of the liver, it is not surprising that the serum globulins should increase, and this rise in the serum globulins could be taken as an indirect sign of liver damage. Unfortunately, the test is nonspecific, there being increase of the serum globulins in any condition in which there is hyperplasia of the reticuloendothelial system.

The flocculation tests were not strictly parallel to the structural lesion. The cephalin cholesterol flocculation showed a more direct relation to the degree of structural damage, while the thymol turbidity and flocculation were more sensitive to minimal structural changes, and it was concluded that perhaps these procedures detect liver disease but are not useful in determining its severity. Accordingly, it was observed that in a large number of cases with minimal to severe lesions the tests were strongly positive. These observations agree with those of Hanger, who has stated that his test, when positive, is related to an active hepatic cell lesion, and with the hypothesis of Kunkel and Popper, who believe that thymol turbidity and flocculation tests measure a regenerative function, which, in turn, implies previous damage of the gland. It must not be overlooked that these tests are nonspecific and may be found disturbed in any condition in which there is hyperacidity of the reticuloendothelial system.

A paper in which all these observations are carefully analyzed will be published in the April issue of the *Revista de Investigación Clínica.*

CORRESPONDENCE

PHYSICIANS FOR GUAM

To the Editor:—The urgent need for physicians in Guam was reported by that island's government in an announcement appearing in an issue of The Journal for September, 1951. Inquiries were invited by the governor, Mr. Carlton Skinner.

For several weeks I corresponded with the director of personnel at Agana in regard to a position. The fact that an applicant was being considered to fill a medical service need, however, implied that some professional official qualified to evaluate and pass on medical credentials was the ultimate appointing authority. Otherwise, the assumption of such responsibility by lay officials would suggest a policy of questionable motivation.

Yet, in March, 1952, a trip to Agana was required to disclose at the Guam Memorial Hospital the existence of a director of medical services, who, however, had no more responsibility for the appointment of his staff of European "DP" physicians than he had for the appointment of the writer of this protest. If the personnel office of the Guam government disclaims responsibility for the selection of medical personnel, then an explanation for not affording applicants contact with the director of medical services is due. The fact that no official source disclosed the complexion of the existing medical staff appears to require no explanation.

No deliberate misrepresentation of conditions at the Guam Memorial Hospital is claimed; the fact of withholding pertinent data speaks for itself. It is, however, specifically charged that only in the most reduced circumstances would a self-respecting physician of experience and background find acceptable the professional working conditions and the living accommodations encountered at this government-operated institution.

If this charge is denied by the personnel department, then its incompetence to select professional personnel is completely obvious, and if the situation as witnessed at Agana constitutes a laboratory test of Oscar Ewing's theories, the welfare and morale of the Guamanian public is not being served any more than is the best interest of a medical publication affording space for the publicizing of such a recruitment campaign.

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ATROPINE IN CANCER

To the Editor:—I am collecting information about the action of atropine and its derivatives in the palliative treatment of cancer, but the literature does not seem to contain any references in this respect, and I should be grateful for any information. The theoretical rationale for using atropine is the abnormal metabolism of choline-containing phospholipids in tumor tissue, with possible production of abnormal choline metabolites, the action of which may contribute to the nervous manifestations of cancer cachexia and may be inhibited by the choline antagonist atropine.

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PROGRESSIVE RESISTANCE EXERCISES

To the Editor:—The paper of Dr. A. L. Watkins (Practical Applications of Progressive Resistance Exercises, *J. A. M. A.* 148:443-446 [Feb.] 1952) merits special consideration by its stressing the use of this form of exercise not only in traumatic conditions but also in neurological and medical cases. This method shortens considerably the convalescence of the conditions mentioned.

Dr. Watkins, speaking of anterior poliomyelitis, points out "that for this method of exercise to be effective the patient must be able to cooperate fully and make a maximum muscle exertion, so that it cannot be employed in the treatment of infants and young children."

My experience does not agree with this statement. By holding the body and involved muscle (or muscle group) in optimal position on a powder board, exerting optimal tension on the muscle at the optimal angle for the joint to be moved, and applying the resistive weight, it is possible to use progressive resistance exercises for most poor to fair muscles of young children without their cooperation.

I should like to add that in hemiplegia I often see satisfactory results with this method by utilization of some pathological reflex phenomena, e. g., training of the triceps muscle with the help of the tonic neck reflex or employment of Strümpell Bergsteiger reflex for improvement of the tibialis anterior.

Even in subacute rheumatoid arthritis it is possible to use progressive resistance exercises after spraying painful joints with ethylchloride.

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AVICENNA

To the Editor:—In the foreign letters, page 181 of The Journal, Sept. 8, 1951, Dr. S. Munther, the main speaker at the second Congress for the History of Medicine convened in Tel-Aviv in May, 1951, stated that "Ibn Sinai known in the literature under the latin name of Avicennae was a Jewish Persian Physician."

Ibn Sinai was born a Moslem Arab from a Persian father converted to Islam. I append some references that indicate that Ibn Sinai is an Arab Moslem physician.

1. Encyclopaedia Britannica, volume 2, page 814, says that "Avicenna (Abu-'Ali al-Husain ibn 'Abdallah ibn Sina) the greatest of Arabian philosophers in the East, and a physician in whom Arabian medicine reached its culmination . . . at the age of ten [he] was well acquainted with the Koran and Arab classics." 2. On page 187 of volume 2 of the same encyclopedia it is stated that "Unquestionably the most illustrious name amongst the Oriental Muslims was Avicenna." 3. The American Illustrated Medical Dictionary, 20th edition, (Dorland), on page 186, says that Avicenna was the "most celebrated Arabian physician and philosopher, 980-1037, surnamed 'The Prince of Physicians.' "

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HIATUS HERNIA AND ANGINA PECTORIS

To the Editor:—In the article "Relationship of Esophageal Hiatus Hernia to Angina Pectoris" by Franklin R. Nuzum, which appeared in the April 5, 1952, issue of The Journal, one of the references, no. 11, referred to an article of mine. Later in the paper Dr. Nuzum makes the statement with reference to the incidence of hiatus hernia that "An ideal control group would consist of a large number of persons with no symptoms in whom a search for hiatus hernia was made. I have been unable to find reports of any such study."

Actually, such a study was reported by Dr. Harold I. Amory and myself in the *Archives of Surgery* (60:1045-1050 [June] 1950). Three hundred ambulatory patients over the age of 50 and without significant gastrointestinal symptoms were studied specifically for the presence of hiatus hernia, which was found in four patients, or 1.3% of the group.

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BUREAU OF MEDICAL ECONOMIC RESEARCH

PENSIONS FOR PHYSICIANS

The following is an abstract of a statement by Frank G. Dickinson, Ph.D., Director, Bureau of Medical Economics Research, on behalf of the American Medical Association regarding H. R. 4371, 82nd Congress, before the committee on Ways and Means of the House of Representatives, May 13-14, 1952. The complete statement with tables and footnotes will be reprinted as Bulletin 89, which can be obtained from the Bureau office on request. Dr. David B. Allman also appeared on behalf of the American Medical Association and reviewed the history of the interest of the Association as shown by the actions of the House of Delegates and the Board of Trustees.

This is an excellent bill, which will meet an evident need, but its provisions are too generous for the young and too restricted for those who are now old. In addition to changes in the excludable amounts specified in the bill, it would also be desirable to have a reasonable "carry-over" provision and to permit persons who do not belong to "a bona fide agricultural, labor, business, industrial, or professional association or similar organization" to participate in the benefits contemplated by this bill.

I shall enumerate the proposed changes without attempting to indicate the exact language needed:

1. The provision for the amount excludable annually (10%, or $7,500, whichever is the lesser) should cease to apply after the aggregate of a person's annual exclusions thereunder reaches a total of 20 times $7,500. I shall refer to this change as "the lifetime limitation of $150,000."

2. There should be added a special rule to provide for additional excludable amounts for those who are now over 55 years of age. I suggest that this additional amount should be equal to 1% of the taxpayer's earned net income, or $750, whichever is the lesser, multiplied by the number of years of his age in excess of 55 determined as of Jan. 1, 1952, but not in excess of 20 and, further, that the additional excludable amount shall not apply to taxable years after he reaches age 75. I shall refer to this change as the "past service credits" limitation and will show how it applies only to those who are now over age 55.

3. In order to carry out this second proposal for "past service credits" it would be necessary to alter the bill so that amounts excluded would be taxable as current income if they were realized in less than five years after they were excluded. The "past service credits" provision that I am suggesting would encourage exclusions to be made after age 60, and they should not be realized in cash or as an annuity in less than five years if the taxpayer is permitted to pay only the capital gains tax on those amounts.

4. The taxpayer should be given some choices in the investment of his excludable amounts. The trust arrangement described in the bill is satisfactory for those who want to have their funds accumulate in that manner. But persons who do *not belong* to associations should be permitted to purchase restricted retirement annuity contracts, which are just as restricted as to distribution of proceeds as is the restricted retirement fund. Furthermore, the individual should probably be permitted to set up a trust fund in any bank of his own choosing.

5. There should be a carry-over provision that would permit the taxpayer to exclude from his next year's income or from his *next two years'* incomes the amounts excluded in any one year over and above the limits set forth. No specific period of years is suggested for the carry-over period. This provision, along with the others suggested above, would provide reasonable limits plus flexibility.

6. Finally, the preamble to H. R. 4371 fails to describe its full purpose with the suggested changes. I would suggest the following substitute language for the preamble: "To remove the discrimination *against* certain persons in regard to the establishment of private pension plans by permitting the postponement of income tax with respect to a portion of earned net income paid to a restricted retirement fund or as premiums under a restricted retirement annuity contract."

I shall first discuss the effects of the original and suggested limitations on the maximum annuities that can reasonably be expected, estimate the average annuities, state and answer some questions, and then proceed to the general reasons for the need for this legislation.

PART 1: MAXIMUM VS. AVERAGE ANNUITIES

Although the first consideration must obviously be the maximum annuity that can be expected under this legislation, it must be realized that probably no one will ever obtain that maximum. My discussion of the maximum annuity will, therefore, be highly theoretical and will locate a theoretical, unattainable boundary. There will be, of course, much more interest in the average pension that can reasonably be expected. The basic purpose of the limitations in this bill with the changes suggested is to prevent, by indirection, the taxpayer from developing a retirement annuity or pension starting at age 70—not the traditional age 65—of more than approximately $1,000 per month.

TABLE 1.—*Maximum Pensions*

Maximum Pensions	1943-47 New Plans	1948-50 New Plans
Maximum dollar pension		
$18,000—$35,000	9%	14%
12,000— 18,000	20	12
9,000— 12,000	12	7
Less than 9,000	22	9
Maximum annual earnings recognized in determining pensions		
$30,000—$60,000	4	3
20,000— 30,000	4	1
10,000— 20,000	4	7
Less than 10,000	..	3
Maximum pension as a percentage of compensation	1	2
No limitation as to maximum pension	24	42
Total	100%	100%

* From "A Study of Industrial Retirement Plans," New York, Bankers Trust Co., 1950, p. 14.

TABLE 2.—*Future Service Benefits*

Pensions, Exclusive of Social Security, as Percentage of Average Compensation	Percentage of Plans in Each Benefit Category Based on 30 Years of Future Service — Average Annual Compensation			
	$2,000	$3,000	$5,000	$15,000
20% and under	8%	10%	1%	3%
21%—25%	29	27	6	2
26%—30%	43	45	16	11
31%—35%	5	4	28	6
36%—40%	6	6	20	9
41%—45%	4	4	19	36
46%—50%	2	2	6	9
51%—55%	..	..	1	16
56% and over	3	2	3	8
Total	100%	100%	100%	100%

* From "A Study of Industrial Retirement Plans," New York, Bankers Trust Co., 1950, p. 12.

The committee must bear in mind *that the amount of the annuity is not the benefit* that this bill would give the taxpayer, for the taxpayer must use his own earned income, *not a part of his employer's gross income.* The primary benefits are: *(1)* encouragement of savings for the needs of old age, a psychological benefit, and (2) a potential reduction in lifetime income taxes. *But the annuity itself is not the benefit.*

How does a *pension of $1,000 per month* starting at age 70 compare with the *maximum amount of pension* that can be developed under *industrial pension* plans approved under Section 165 of the Internal Revenue Code? According to the 1950 *edition* of "*A Study* of Industrial Retirement Plans" (Bankers' Trust Company, New York), 42% of the new plans (1948-1950) do not provide any *limitations on maximum* pensions (tables 1 and 2). In addition, 14% of the *new* plans *limit* the maximum pension to from $18,000 to $35,000 per year, and 12% limit the maximum pension to from $12,000 to $18,000 per year. Thus, according to their report, only 32% of the plans limit the maximum pension to less than $12,000 a year.

Generally, we can say that the Reed-Keogh Bill, with changes suggested, would establish a limit on annual pensions that is less than the dollar limit in 68% of the new pension plans approved during 1948 to 1950 under Section 165 of the Internal Revenue Code. In this comparison five points should be borne in mind.

First, the employer does not pay all of the cost; some students and practicing actuaries use a two-to-one ratio as a rule of thumb; that is, the employer pays about twice as much as the employee under most pension plans. Accordingly, some would argue that our maximum pension of $12,000 per year should be compared with a maximum pension of $18,000 per year in an industrial pension system from the standpoint of tax deferment.

A second point is that we are talking about a maximum pension of $1,000 per month starting at age 70, whereas 88% of the new pension plans approved during 1948 to 1950 specify age 65 as the normal retirement age. As you know, a pension starting at age 65 costs more than one starting at age 70; at prevailing rates charged by insurance companies for a cash refund annuity, the single premium at age 65 is about 10.6% higher than the single premium at age 70.

A third point is that the cost of an annuity for a female is higher than for a male, and the general maximum of $1,000 a month starting at age 70 for males means a lower maximum for females under this bill. The Bankers' Trust Company study seems to imply that their data on maximum pensions refer primarily to males, but I am not completely sure of this. At any rate, a pension of $1,000 per month for a female requires larger accumulations than a pension of equal amount for a male and all of my computations are based on the rate for males.

A fourth point is that this general limit of a monthly cash refund annuity of approximately $1,000 starting at age 70 would be, of course, only 16% of $75,000, the minimum annual earned income required for the maximum annual exclusion, $7,500, from taxable income. As will be shown later, a person with an earned income of $37,500 every year for 40 years could obtain a pension of almost the same amount starting at age 70, and, thereby, his pension would be approximately 32% of his "average" annual earned income. The maximum would be about 32%. According to table 2, only 3% of the new plans aim at a comparable pension percentage of less than 20.

A fifth point is that industrial pension systems usually base the amount of pension on an average of the highest 5 years of earnings, or the highest 5 consecutive years of earnings, or the last 15 years of earnings; few of the newer plans base the pension on an average of earnings for every year. Under this bill the latter rule is followed, and the excludable amounts will be low for the typical person in any class during his 20's and 30's, when his earnings are relatively low.

In this entire discussion I shall use prevailing annuity premium rates. If the interest rate in future decades should rise and the mortality remain constant, the annuity premium rates or pension costs would decline. A decline in mortality rates among persons receiving pensions would, of course, tend to increase future annuity rates. An increase in the premium rate means a decrease in the monthly benefit that can be purchased with a single premium of $1,000.

A list of the single premiums used in my computations may be helpful. For a cash refund annuity of $1,000 per month the single premiums used are: age 65, $222,720; age 70, $201,456; and age 75, $181,692. Although I have not used the "installment refund" or "no refund" annuity in my computations, the comparable single premiums may be useful. For an installment refund annuity of $1,000 a month the single premiums are: age 65, $210,360; age 70, $187,032; and age 75, $164,772. For a "no refund" annuity of $1,000 a month the single premiums are: age 65, $159,072; age 70, $132,348; and age 75, $107,784. I have used the cash refund annuity because it is the type that most persons would elect. Under the "no refund" type no payments are received after the death of the annuitant. Obviously this is the cheapest of the three types. This type has the disadvantage that it does not fit the purposes and the procedures of this plan, which encourages a voluntary system of pensions that can be viewed as either a savings plan or an annuity plan. The savings feature is so strong that only the cash refund annuity seems to qualify. Perhaps a case could be made for the installment refund, which provides that the monthly annuity shall continue after death until the sum of the monthly amounts equals the single premiums. The cash refund annuity provides that this difference be paid in cash at the time of death instead of being paid in installments.

PART 2: QUESTIONS AND ANSWERS

1. What is the effect of the lifetime limit of $150,000? Suppose a taxpayer had an earned income of $75,000 every year from age 26 to 65, an almost unimaginable experience. Without this lifetime limit he could exclude $7,500 a year from age 26 to age 65 (inclusive), or a total of $300,000 during his lifetime. His cash refund annuity would be $2,270 a month starting at age 65 and $2,840 a month starting at age 70. These high amounts would be, in our opinion, contrary to the public interest. We have insisted on a lifetime limit on maximum annual exclusions.

The lifetime limit of $150,000 will prevent him from paying $7,500 in more than 20 years, half of the traditional 40 year working lifetime. If he were to start at age 32 and exclude $7,500 in alternate years, his lifetime excludable total would be $150,000 and his pension starting at age 70 would be $1,239 a month. For computing pension benefits the lifetime limit does, in effect, cut the annual dollar limit in half—from $7,500 to $3,750; or it cuts the "excludable years" from the traditional 40 working years to 20. It has this general effect while creating flexibility. If the taxpayer made the 20 annual payments of $7,500 from ages 35 to 54 (inclusive), his monthly pension starting at age 65 would be $1,129, or, starting at age 70, it would be $1,412. In a less unlikely case a person would exclude the maximum from ages 45 to 64 or from ages 51 to 70.

Thus the general effect of the lifetime limit of $150,000 is to make it impossible for even a person with an annual earned income of $75,000 every year to obtain a pension starting at age 70 very much in excess of $1,000 per month. That is the major purpose of the lifetime limit of $150,000.

One important feature of the lifetime limitation might be overlooked. The limitation is a maximum dollar amount. It does not also limit the percentage, although the annual limit is stated as $7,500, or 10%, whichever is the lesser. Thus, there is no lifetime percentage limitation; the counterpart would have been that the lifetime sum of the percentages could not exceed 20 times 10, or 200. If a maximum limitation had been applied to the percentages as well as to the dollars, persons receiving annual earned incomes of less than $75,000 would have been handicapped severely. Making the limitation apply only to 20 times the annual dollar maximum gives persons of lower incomes an opportunity to pay in more years and thereby achieve higher pensions. For example, take the case of a man who earns $37,500 a year every year from age 27 through age 65. He could make 40 payments of $3,750 totaling $150,000, which would finance an annuity of $1,135 per month starting at age 65, or $1,420 per month starting at age 70. The lifetime sums of his exclusions would be $150,000 and 400% of annual incomes. Other illustrations, using lower earned incomes, would demonstrate that this bill with the suggested changes would benefit the eligible taxpayers in the lower income groups.

2. How much would the annuity be increased if the computations were made for different types of annuities—no refund and an installment refund—without the lifetime limitation? Without the lifetime limit of $150,000 a taxpayer could pay $7,500 annually from age 26 to 65 if he earned $75,000 every year and obtain a monthly no refund annuity of $3,178 or a monthly installment refund annuity of $2,403 starting at age 65. As already mentioned, the cash refund annuity for this man would be $2,270 starting at age 65. A cash refund annuity has been used in all of these computations because, among other reasons, it is the type that most persons would elect.

3. What is the effect of the past-service credit—the special rule that permits additional excludable amounts for persons over age 55 when the act first becomes effective? The extra amount is $750 or 1%, whichever is the lesser, multiplied by the difference or excess in years between the attained age when the act first becomes effective and age 55, with a maximum multiple of

20 (again) and with the last taxable year being the year when the taxpayer attains age 75. During 1953 the maximum extra excludable amount and the corresponding maximum extra excludable percentage of earned income will be determined and will remain unchanged as the taxpayer approaches age 75, after which they will become zero. (The "normal" amounts could be excluded at ages above 75.) The effects of this past-service credit, a feature of most industrial pension plans approved under Section 165 and an outstanding feature of the O. A. S. I. primary benefits under the Social Security Act, are set forth in table 3.[1] Past-service credits are very costly in any pension system. The normal pension starting at age 75 derived from the normal contributions are shown in column 9 of table 3. A person aged 56 when this act becomes effective could exclude annually $7,500 plus $750 and accumulate enough in the trust fund to purchase a monthly annuity starting at age 75 of $1,054 from the "normal" contributions, plus $105 from the additional contributions, making a total monthly annuity of $1,159. An examination of column 11 will show that, for persons aged 56 to 65 when this act becomes effective, the real effect of the past-service excludable amount is to bring the monthly annuity starting at age 75—an extremely high age—up to little more than $1,000 per month. The general effect, therefore, of these additional excludable amounts, which I have called past-service credits, is to enable many of those who are now above 55 years of age to achieve an annuity of little more than $1,000 per month starting at the high age of 75 if their annual earned income is $75,000 each year.

We support this past-service credit provision for the same reasons we support the lifetime limit of $150,000—because both are in the public interest.

4. Why choose over age 55 instead of choosing over age 50 for eligibility for these past-service credits? The primary answer to this question is that those in the age group 51 to 55 when this act becomes effective can by excluding the maximum "normal" amounts each year obtain a pension of close to $1,000 per month starting at ages 70, 71, 72, 73, or 74. The man at age 51 without benefit of past-service credit could pay $7,500 twenty times and have enough in the trust fund to purchase a monthly annuity of $951 starting at age 70; the man aged 52 could purchase a monthly annuity of $971 starting at age 71; the man aged 53, $991 starting at age 72; the man aged 54, $1,012 starting at age 73; the man aged 55, $1,033 starting at 74. Since persons in this age group (51 through 55) could finance a maximum annuity of close to $1,000 per month starting 20 years later, there is no great need for the provision for the extra excludable amounts to apply to any person below age 56 when this act first becomes effective.

5. What would be the average pension? The first four questions have dealt with maximum pensions, which are an important practical consideration only for an extremely rare case in establishing the boundaries for this voluntary pension system. It is difficult to imagine any person having an earned annual income of $75,000 every year from age 26 to 65 or from age 31 to age 70. There is not enough information available on the earned income by age groups for all earners in the United States—not simply for the self-employed alone—to prepare any careful estimates of average pensions and average amounts that could be excluded. Fortunately, the United States Department of Commerce in recent years has made surveys of the incomes of physicians, lawyers, and dentists. The average income in these surveys for each five-year age group can be used to approximate averages for the members of these three professions.

It is necessary to make several assumptions. First, I shall assume for purposes of computation that a man's earning lifetime is divided into periods of five years each, that he earns the average income for his age group throughout each period, and that he will exclude 10%—the maximum—of his earned income annually. (This is another maximum.) Second, I shall assume that he pays the annual sum into the pension fund on each birthday and that the amount accumulates at 2½% interest, compounded annually. At this point it should be realized that the over-all average professional earnings for members of each of these three professions at all ages can not be used in a simple calculation—$11,858 for physicians with major source of medical income from independent practice (excluding salaried physicians); for lawyers, $7,517, and for dentists, $7,047. I wish we could use the over-all average income. Also, it should be noted that the surveys covered the incomes of physicians in 1949, of lawyers in 1947, and of dentists in 1948—a fact that lowers somewhat the averages used in this computation for lawyers and dentists as compared to those for physicians and presents somewhat lower averages than would the 1952 averages for each profession. In order to produce some measure of uniformity, the relatively few physicians, lawyers, and dentists below 25 years of age were excluded. It is also assumed that the earned income averages by age groups remain unchanged during the next four decades; this assumption is the most unrealistic, but without it no computations could have been made. The average monthly pension starting at age 70 for the three groups (table 4) would be as follows: (1) for all physicians now in independent practice (at all ages), $208, plus or minus 10%; (2) for all lawyers now in independent practice (at all ages) $146, plus or minus 10%; and (3) for dentists now in independent practice (at all ages) $140, plus or minus 10%.

These average pensions starting at age 70 certainly cannot be regarded as exorbitant; also, they are far below the maximum pensions previously discussed. Since they are averages, some physicians, lawyers, and dentists will get more and some will get less. The actual benefits—the tax savings—might not exceed one-fifth of the amount of the pensions. No postwar income data are available for the two professions with the highest pre-World War II earnings—certified public accountants and consulting engineers. I do not know how to make similar computations for other taxpayers, but I believe that we can safely say that this voluntary pension system, which will not permit a pension of much more than $1,000 per month starting at age 70, will produce an average pension of somewhere between $150 and $300 a month; perhaps a closer approximation under the assumptions would be a range for the average pension of $150 to $250 per month. Since one of the assumptions is that the taxpayer in each of these three professions would pay the full 10% of his earned income every year into the pension trust, there is reasonable doubt that the average pension would be as high as $150 to $250 per month starting at age 70.

TABLE 4.—*Some Expected* Average Results for Physicians, Lawyers, and Dentists from H. R. 4371 with Suggested Changes*

	Average Monthly Pension Starting at Age 70	Ages	Average Excludable Amount in 1953	Ages
"All" physicians......	$208 ± 10%	25 to 69	$1,286 ± 10%	25 to 74
"All" lawyers.........	146 ± 10%	25 to 69	860 ± 10%	25 to 74
"All" dentists.........	140 ± 10%	25 to 69	756 ± 10%	25 to 74
A new physician......	465 ± 10%	25	679 ± 10%	25 to 29
A new lawyer.........	287 ± 10%	25	318 ± 10%	25 to 29
A new dentist.........	299 ± 10%	25	487 ± 10%	25 to 29
	Pension at Age 75			
A physician now aged 56	131 ± 10%	..	1,455 ± 10%	..
A lawyer now aged 56	121 ± 10%	..	964 ± 10%	..
A dentist now aged 56	72 ± 10%	..	786 ± 10%	..

* Based upon average net professional income in 5-year age group reported by William Weinfeld in the **Survey of Current Business**, U. S. Department of Commerce, for physicians in 1949, lawyers in 1947, and dentists in 1948. ("Income of Physicians, 1929-1949," July 1951, pp. 9-26; "Income of Lawyers, 1929-1948," August 1949, pp. 1-7; "Income of Dentists, 1929-1948," January 1950, pp. 8-16.) It was assumed that every person in each age group would exclude the maximum amount permissible from taxable income—an assumption which makes the averages too high. The number of persons in each age group who responded to the U. S. Department of Commerce income questionnaires was used in obtaining the averages for persons at all ages in columns 1, 2, and 3. It was also assumed for the computations that new entrants into the professions were typically age 25, although it is well known that most physicians start practice several years later.

The monthly pension, on the basis of perpetuating the age-earnings progressions in the three surveys, starting at age 70 (in calendar year 1998) for a young man entering practice in 1953 at age 25 would be: for a physician, $465; a lawyer, $287;

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[1] Table 3 appears only in the reprints of this article.

and a dentist, $299. These averages represent the maximum opportunity for the average new entrant into each profession. Again, the benefit is not the pension that he could have purchased directly in the absence of this bill out of his earnings after taxes; the benefit comes only from buying these annuities before taxes.

6. How much could physicians, lawyers, and dentists exclude from their taxable incomes the first year (1953) this bill is in effect? It is hazardous to attempt to guess the aggregate excludable amount for each profession. I would prefer, therefore, to first estimate the excludable amount of an average member of each of the three professions who would exercise his rights under this bill.

(*a*) The maximum excludable amount for a physician during 1953, on the assumptions noted above, would be approximately $1,290, plus or minus 10%. I would not attempt to guess the number of thousands of physicians who would, under this bill, exclude the maximum amounts during 1953. The potential number of thousands, according to the definitions used in our computations, would be about 160.

(*b*) The maximum excludable amount for a lawyer during 1953 would be approximately $860, plus or minus 10%. Again I would not know how to estimate the number of thousands of lawyers who actually would, under this bill, exclude their maximum amounts. I judge that the maximum number in thousands would be about the same for physicians as for lawyers, 160; but this is only a guess.

(*c*) The maximum excludable amount for a dentist during 1953 would be $756, plus or minus 10%. I would not want to guess how many thousands of dentists actually would, under the bill, exclude the maximum amounts during 1953. The potential number of thousands is somewhat less than 80.

In summary, for these three professions 400 million dollars (200 plus 140 plus 60) could theoretically be excluded from 1953 taxable income, provided every member of each of these three professions excluded his maximum amount. Considering a number of imponderables and the difficulties that all citizens face in trying to set aside money for old age, I have a strong feeling that the members of these three professions in 1953 would not exclude more than 40 million dollars from their taxable incomes under the provisions of this bill. The most important of these imponderables is the unattractiveness of the trust fund as a form of investment because of the restrictions that have been incorporated in this bill—and I think these restrictions are in the public interest. I refer to the fact that one cannot borrow, one cannot use in any way the accumulations in this trust until one attains 60 years of age, except as a death benefit or for permanent and total disability. Only a small minority of industrial pension plans have restrictions anywhere near as severe.

A young man getting started in his profession at, say, 30 years of age will not find the opportunity to set aside 10% of his earned income into this fund a serious temptation to defer taxes, since he cannot touch the fund in any manner for his ordinary financial crises. What is the inducement? The bill will definitely encourage some saving for old age, but the only financial advantage, other than the capital gains option, is the privilege of paying the income tax on the amounts set aside when they are distributed to him during his retired years when presumably he will be in the lower income tax bracket. I would stress the word "presumably." There can be no tax avoidance, only deferment. The taxpayer must use his own funds, not his employer's. The taxpayer must elect to save rather than spend his own earned income. The amount of the pension is not the benefit; the benefits are the encouragement to save for retirement and the prospect of lower lifetime taxes. Specifically, the gain to him per $1,000 excluded would be the difference between the income tax that would have been levied against this $1,000 during each of the working years of his life and the income tax per $1,000 of taxable income during his retired years; or, if he should draw out the accumulated trust fund in one lump sum, the difference between the current income tax per $1,000 and the capital gains tax on $1,000.

The 1951 income tax rate schedule does not have a constant percentage increment. The starting rate is 20.4% on taxable income of not over $2,000, rising 2% for the next income group, $2,000 but not over $4,000; then it jumps 4.6 percentage points to 27% on taxable incomes between $4,000 and $6,000; in the next bracket in the scale it rises 3%, in the next, 5%, in the next bracket, 4%, etc. Thus the increment in the ranges from 2% to 5% on taxable incomes of $2,000 to $15 The advantage of tax deferment, except when capital gain involved, is in paying a lower tax rate during the retired ye as the annuity is received than would have been applicabl during the working years of life. Future increases in tax rates could eliminate all gains from tax deferment; future decreases in rates would, of course, enlarge the gains. It should be carefully noted that the greatest prospective "one step" gain in the tax rate is for a person who would have paid the minimum rate of 20.4% on the excludable amounts during his working lifetime—if he had not excluded the amounts—and has exemptions that cover all of his income during his retired years. The value of his tax deferment to him, at current income tax rates, is 20.4%—equivalent to the increment of 4 to 10 tax brackets. From this point of view, the greatest tax savings percentagewise from tax deferment under this bill may actually be enjoyed by persons in the low income group.

PART 3: GENERAL REASONS

Until 1935 the problem of financing the retired years of life had been left largely to private initiative, although a few states had enacted pension laws. The Social Security Act of 1935 was a landmark. It embodied the notion of social responsibility for furnishing minimum income to our older citizens. That act, as amended, still provides only a floor of protection. Employers pay their half of the tax out of gross receipts and, accordingly, such sums are not subject to federal taxes. Employees pay their payroll tax after federal income taxes. The resulting O. A. S. I. pension is not subject to tax, not even the small portion that the employer financed by his contributions. The formula for determining the monthly benefit is weighted in favor of the low paid and older employees.

The second landmark was Section 165 of the 1942 Federal Internal Revenue Code. Under its provisions pension and profit sharing plans and trusts established by employers for the benefit of employees could be approved if they met certain requirements. And the current contributions of the employer are never taxable to the employer and not to the employee until he receives the benefits, usually during his retired years. The benefits under these plans are not limited to the low income group. The intention of Section 165 was to encourage a second layer of pensions and to generally meet some of the retirement needs of persons earning more than $3,000 or, since 1950, more than $3,600.

The first two steps have been taken by the Social Security Act of 1935 and Section 165 and related sections of the 1942 Internal Revenue Code. The bill, with the suggested changes, that we are discussing today is the third step to complete the changeover from a general social theory of leaving the financing of old age to private initiative to the new social theory of having the federal government encourage the individual to set aside some of his earned income for old age.

From the broad social and economic standpoint, why is this third step so necessary? I shall stress the needs of physicians, although most of what I say will apply with almost equal force to lawyers, dentists, and other professional persons. The very nature of professional work and training makes this discrimination against the self-employed professional man especially burdensome. The total lifetime income taxes paid by a physician on a lifetime income of a certain amount may greatly exceed those paid by a nonprofessional person on the same amount of lifetime income, because the physician has a long training period and his high earnings are "bunched" into a relatively small number of peak years. I am not talking about most of the physicians who are employed, because their employers are encouraged by Section 165 and related sections to establish pension systems. Their employers can set aside funds for pensions, which, as already noted, are deductible from company income as business expenses and are not even taxable income to the employee until he receives the benefits years later.

Consider the cost of becoming a physician. Typically, the doctor has spent three or four years in premedical training and four years in medical school. He was not an average student but was an above average student. There followed one year of internship at nominal rates of pay, and, for most, internship was followed by one or more years of residency training at nominal salary. Elsewhere I have estimated that the cost to the physician of his training on the first day he starts to practice is at least $35,000. Our tax laws do not permit him to depreciate this capital cost of becoming a physician, nor am I advocating any change of the tax laws in that direction. So the physician who enters practice at 28 to 30 years of age will not have the opportunity to depreciate his investment for tax purposes. The average physician will, of course, earn several times the average income of all wage earners.

As has been noted by others, the laws of many of our states prohibit the corporate practice of medicine, for it is contrary to the public interest. The professional man should be responsible for his acts. Since he cannot incorporate, he must practice as an individual proprietor, in a partnership, or (rarely) as an employee.

MEDICAL MOTION PICTURES

Anorectal Divulsion Versus Pectenotomy: 16 mm., color, silent, showing time 15 minutes. Prepared by Manuel G. Spiesman, M.D., Chicago Medical School, and Louis Malow, M.D., Mount Sinai Hospital, Chicago. Produced in 1951 by and procurable on purchase (apply for price), or loan from Mervin LaRue & Co., 159 E. Chicago Ave., Chicago 11.

The stated purpose of this film is to give a review of the etiology of fissure in ano and to describe a new approach to the surgical treatment of this condition. The film shows the origin and location of the pathological fibrous connective tissue band in the anal canal called the "pecten band," which gives rise to anal tightness and is commonly found in conditions like fissure in ano, cryptitis, papillitis, fistula, and pruritus ani.

The reviewers do not agree entirely with the authors' conception of this entity, because the story as brought out in the film is not complete from a teaching standpoint. The pecten band is pathological. Therefore a logical question should be raised as to the pathogenesis of this abnormal band of fibrous tissue. Could it not be another manifestation of anal infection? The surgical correction of the pecten band is nicely shown and is indeed preferable to the crude and surgically unsound practice of divulsion. The authors' technique includes destruction of additional anal crypts by means of excision. The suggestion is offered that, were all demonstrable anal crypts destroyed by means of multiple craniotomy (i. e. incision along a hook and excision of the margins of the resulting wounds), the subcutaneous band of fibrous tissue would be incised at several points, rather than posteriorly alone. This procedure insures ample room in the anal canal and is a prophylactic measure against further anal infection. The color photography is well done. The film will be of primary interest to general surgeons and will also be of interest to general practitioners, proctologists, and house officers. It is hoped that this film will stimulate productive discussion of the subject.

Ages and Stages Series: 16 mm., black and white or color, sound. Produced in 1951 for the Department of National Health and Welfare and the National Film Board of Canada by Crawley Films, Ltd., Ottawa. Procurable on purchase from McGraw Hill Book Co., 330 West 42nd Street, New York 18. For rental, consult local film libraries.

He Acts His Age: showing time 14 minutes (black and white $60, color $120). This film is an overview of a series being produced showing growth developmental stages of children from 1 to 15 years of age. It is an excellent introduction to the more detailed films to follow. It points out the fact that understanding what to expect of children at various ages is a prerequisite to helping in their emotional development. This film of children at play gives us authentic information.

The Terrible Twos and the Trusting Threes: showing time 22 minutes (black and white $80, color $160). This is the first film of the series that deals with specific age groups. A nursery school play yard and the home are the settings for this realistic, positive motion picture of the aggressiveness and uncoordinated activities of the "terrible twos" who, with patience and loving understanding, develop into the "trusting threes." The film is especially helpful in showing how distractions rather than punishment, affection and understanding rather than irritations, and constructive activity go to create a happy child. There is nothing threatening in this film. It shows that parents are human and can be irritated without being punitive. It cannot help but give them many stimulating ideas. It is down to earth and full of humor and practical suggestions, and its people are real.

The photography and narration are noteworthy. Obviously, great care has been taken in the selection of subjects and situations, and an unusually fine result is obtained. These are real scenes and actual countryside homes, where the children have been photographed in natural and expressive ways. Both of these films, and it is hoped those that follow, should be classics in the field of child guidance and parent education. They are recommended for all parent groups, nursery school teachers, persons in any field of medicine concerned with children, and for the training of teachers.

Tolserol (Mephenesin) in Rheumatic Diseases: 16 mm., color, sound, showing time 18 minutes. Richard T. Smith, M.D., Technical Adviser. Produced in 1951 by the DeFrenes Co., Philadelphia. Procurable on loan from E. R. Squibb & Sons, 745 Fifth Ave., New York 22.

This film is a report on a drug concerning which further investigations are in progress. Dr. Smith begins the presentation by explaining, with the aid of animation, the mechanism of action of mephenesin (tolserol®) in relation to rheumatic disorders and the muscle spasm-pain-muscle spasm cycle. Next he presents a pictorial report of the response to mephenesin of five rheumatic disease patients. The demonstrated conditions were selected from a published series of 200 patients treated in the department of rheumatology of the Benjamin Franklin Clinic, Pennsylvania Hospital, Philadelphia. Rheumatoid spondylitis, lumbago, fibrositis, acute stiff neck, and acute bursitis cases are shown. Each case is presented individually: first, the condition before the administration of mephenesin, and then the effect of the drug on the condition. Dr. Smith's commentary points out the dosages used with the various patients, the duration of action of the drug, and other medical points significant of the use of mephenesin in the treatment of the conditions presented in the film. The patients in the film were chosen to demonstrate the maximum benefit that can be expected. Certain other rheumatic conditions studied, he says, show less response to the drug, and he explains when and why.

This is a good demonstration of the action and the clinical application of the drug. It makes a proper division between its effectiveness in the treatment of acute and chronic conditions. The picture is well organized, and the photography, animation, and narration are excellent. It is recommended for general practitioners, interns, and residents.

Drug Addiction: 16 mm., black and white, sound, showing time 21 minutes. Produced in 1952 by Encyclopaedia Britannica Films, Inc., in cooperation with the Juvenile Protective Association of Chicago and the Wieboldt Foundation. Consultant: Andrew C. Ivy, M.D., University of Illinois. Procurable on purchase ($95) or rental from Encyclopaedia Britannica Films, Inc., 1150 Wilmette Ave., Wilmette, Ill. or on rental from local film libraries.

This film traces the case of a teen-age boy who has become addicted to the use of narcotics. It follows the events in his life including his first introduction by another boy to marijuana and to the local supplier, his becoming a diacetylmorphine (heroin) addict and peddler, his committal to a hospital, and the early days of his return from the hospital. Several episodes from his life during this period illustrate the unglamorous aspects of the addict's life, including the necessity of turning to crime to get enough money to pay the ever-increasing cost of narcotics. An explanation and description of the supply and distribution channels is also included.

The situations presented in this picture are those that actually exist in many communities, and the youngsters that are involved in drug addiction are reasonably normal adolescents who have been exposed through taking a dare rather than through the pressure of social conditions. There is no indication that drug addiction is an entertaining experience. The entire presentation is in a manner suitable for the instruction of young persons and for helping their parents understand some of the problems these young persons face. Two important control measures and the treatment of addiction are brought out, though not sufficient emphasis is given to education even though the film is intended as an educational medium. The photography and narration are good. This is, generally, a satisfactory film for illustrating the problems of drug addiction among adolescents to parents, and it could also be used with selected high school groups. It might put ideas in the minds of adolescents, but if there is a question in their minds it might help them to resolve their problems. The film should not be shown without a suitable trained adult guidance and discussion leader.

BUREAU OF LEGAL MEDICINE AND LEGISLATION

MEDICOLEGAL ABSTRACTS

Evidence: Physician as Witness Against Osteopath.—The plaintiff sued for damages for the death of her husband alleged to have been caused by the negligence of the defendant osteopaths. From a judgment in favor of the defendants, the plaintiff appealed to the Supreme Court of Michigan.

Mr. Bryant entered a hospital and underwent a thyroidectomy, which was performed by one of the defendants at the direction of the other. He died the day after the operation. The plaintiff contended that it was the duty of the defendant to "attend plaintiff's decedent in a skillful and careful manner, to use those methods of examination, diagnosis, and surgery which are usually prescribed and used in the art and profession of osteopathic medicine and surgery . . . including basal metabolism laboratory tests, cardiograph and X-ray treatment before undertaking surgery upon the plaintiff's decedent's body, and to use proper care, attention, medication, and treatment prior to the surgical operation for the purpose of properly preparing the plaintiff's decedent for surgical operation so as to reduce the risks thereto involved." The defendant osteopath who performed the operation admitted the performance of the operation and his duty to attend the plaintiff's decedent in a careful and skillful manner and "to use the methods prescribed by the profession of osteopathy." He further averred that such duties were fully performed by him. He specifically denied that a basal metabolism test, cardiograph, or x-ray treatment were necessary to a proper diagnosis of the plaintiff's decedent's condition and alleged that "the usual care, attention, medication and treatment was given to plaintiff's decedent prior to the surgical operation."

The plaintiff's principal witness was a physician and surgeon duly licensed as such in the state of Michigan who was qualified as an expert in his field of practice. He testified to his experience in treating thyroid patients and was permitted to state, over the objection of counsel for defendants, what he considered to be the standard of practice involved in the management of such patients. The hospital record indicated that the treatment actually given Mr. Bryant was not in accord with the claim of the witness as to the standard practice, and the witness was permitted to express the opinion that the failure, in the instant case, to comply with the standards of practice detailed by him might or could have reduced the patient's chance of survival.

Defendant's objections to the testimony of this witness were based on the claim that the witness did not know the methods of treatment, care, and operation customarily followed by practitioners of osteopathy, or the degree of care and skill customarily employed by ordinary practitioners of such school in the community or similar communities. In this connection the witness testified that he was not familiar with osteopathic schools and that he had no knowledge as to their teachings, other than by hearsay. He had never attended any osteopathic clinics, or discussed with osteopathic physicians and surgeons the question as to what constitutes proper preoperative or postoperative care. He indicated also that he was not familiar with osteopathic literature and that he had no knowledge of the fundamental concepts of osteopathy or osteopathic viewpoints of symptomology.

It has been repeatedly held, said the Supreme Court, that the implied contract between a patient and surgeon requires the latter to use the degree of diligence and skill ordinarily exercised by the average of the members of the profession in the same locality or in similar localities, with due consideration to the state of the profession at the time. Thus it was the duty of the defendants to treat Mr. Bryant's ailment with due and proper care. Furthermore, the defendant in a malpractice action is entitled to the testimony of competent practitioners of his own school of medicine on the issue of whether he exercised the requisite degree of skill and care in such treatment. In other words, it was the duty of these defendants to use that degree of care and skill in their handling of the case and in the treatment given the patient customarily used by practitioners of osteopathy, and they were not held to the observance of standards of practice or methods of practice customarily used by practitioners belonging to other schools devoted to the cure, alleviation, and treatment of human ailments and diseases. Thus the alleged failure of the defendants to exercise the requisite degree of care and skill in the treatment of plaintiff's decedent could not be established other than by the testimony of an expert or experts familiar with the ordinary methods and standards of practice of osteopathic physicians in the community or in similar communities, and the plaintiff could not complain that the methods and standards of practice customarily observed by another school were not followed.

This rule, continued the court, does not, however, exclude the testimony of physicians of other schools or experts in other lines when that testimony bears on a point as to which the principles of the two schools concur, such as matters of diagnosis, the methods and dangers of the x-ray or other electrical or mechanical appliances in common use by the several schools, or the existence of a condition that should be recognized by any physician of any school. The plaintiff's claim is that the testimony of her principal witness should be held sufficient to establish that the methods and standards of practice of osteopathic practitioners, in a case of the character here involved, were the same as those of the school to which he belonged. However, a consideration of all the testimony of the witness in question leads to the conclusion that the claim made is not tenable.

Furthermore, continued the Supreme Court, we are not here concerned with the duty of a practitioner of any school for the treatment, cure, and alleviation of human ailments to exercise due and proper care in making a diagnosis. No claim is made that the defendants did not correctly diagnose the cause of the plaintiff's condition. The plaintiff's cause of action rests primarily on the theory that the defendants did not follow, in preparing the patient for the operation and in treating him thereafter, the methods customarily taught in osteopathic schools in their practice in the same community or in similar communities. Under the situation here presented plaintiff's claims could not be established other than by the testimony of an expert or experts possessing the requisite knowledge as to proper care and skill with reference to such matters according to the teachings of osteopathic schools and the methods customarily employed by osteopathic practitioners, as suggested by the applicable test. In view of the repeated statements that the plaintiff's witness had no knowledge of osteopathy or the methods and standards of practice generally of osteopathic practitioners, the conclusion necessarily follows that he was not competent to testify whether the defendants exercised due and proper care, according to the applicable test, in treating Mr. Bryant's ailment and in performing the operation. Obviously the standards of practice that the witness indicated should be followed in such a case were those of his own school and those which his own study and experience had persuaded him were correct. In giving his testimony he was not speaking from the standpoint of osteopathic schools or practitioners nor was he in a position to do so.

Accordingly, the Supreme Court held that the testimony of the plaintiff's principal witness was not competent for the purpose for which it was offered. The judgment in favor of the defendants were therefore affirmed. *Bryant v. Biggs et al., 49 N.W. (2d) 63 (Michigan, 1951).*

MEDICAL LITERATURE ABSTRACTS

UNITED STATES

A.M.A. Arch. Surgery, Chicago

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*Terramycin in Treatment of Peritonitis. E. Reiss, E. J. Pulaski, C. P. Artz and J. R. Shaeffer.—p. 5.
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*Parenteral Nutrition with Solution Containing 1,000 Calories per Liter. C. O. Rice, J. H. Strickler and P. S. Erwin.—p. 20.
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Simple Percutaneous Technique of Stable Nailing of Fractures of Neck of Femur. H. Gelbke.—p. 51.
Cross Circulation for Intracardiac Surgery. J. L. Southworth and E. C. Peirce II.—p. 58.
Histology of Goiter and Blood Iodine. V. E. Chesky, W. C. Dreese, B. O. Duboczky and C. A. Hellwig.—p. 64.
Aneurysm of Anomalous Pancreaticoduodenal Artery: Case Report and Review of Literature. J. W. Sampsel, F. M. Barry and H. D. Steele. —p. 74.
Shock Therapy with Intraperitoneal Infusion of Blood Volume Replenishers, Dextran and PVP. J. K. Narat, P. A. Casella and J. P. Cangelosi.—p. 80.
Carcinoid Tumors of Small Intestine: Report of Additional Case of Malignant Ileal Argentaffinoma with Frank Mucosal Ulceration in 32-Year-Old Woman. C. R. Bowers and J. H. Cheek.—p. 92.
Some Limitations of Lumbar Sympathectomy in Arteriosclerosis Obliterans: Early Results in 100 Consecutive Cases. R. G. Smith, M. Gullickson and D. A. Campbell.—p. 103.
Cervical Traction Frame. E. F. Schmerl.—p. 108.
Critique of Mushroom-Catheter Treatment of Acute Gastroduodenal Perforation. G. V. Eckhout.—p. 111.

Terramycin in Treatment of Peritonitis.—The histories of 68 patients with peritonitis are reviewed, 47 who were treated at Brooke Army Hospital and 21 at Tokyo Army Hospital. Among the patients at Brooke Army Hospital the peritonitis was of appendical origin in 28 and in the remaining 19 it arose from a variety of causes, including pelvic inflammatory disease, gangrene of the bowel, perforated peptic ulcer, gunshot or knife wounds of the abdomen, perforated carcinoma of the stomach or colon, and perforated sigmoid diverticulum. All but 3 of the 21 Tokyo patients had peritonitis secondary to gunshot wounds of the abdomen. Terramycin was given initially to 31 of the 47 patients at Brooke Army Hospital and to the other patients after penicillin and streptomycin, penicillin alone, aureomycin, and chloramphenicol had failed to bring the disease process under control. When terramycin was used initially, it was given within 24 to 48 hours after the onset of the disease. The patients treated at the Tokyo Army Hospital, however, did not arrive at that hospital for an average of eight days after injury. Emergency surgery, including suture of the small bowel and colostomy, was performed in the forward areas, where the penicillin and streptomycin were given routinely in combination. The uniform dosage regimen for treatment with terramycin consisted of 1 gm. of terramycin intravenously every 12 hours for 2 to 4 days and then, as soon as oral medication could be tolerated, 0.5 gm. by mouth every 6 hours for 8 to 10 days. The largest number of excellent responses was achieved in the patients with spreading peritonitis. The incidence of such dramatic results declined in the less virulent infections (localizing and localized). Of the 32 patients with spreading peritonitis, results were excellent in 17, good in 8, doubtful in 1, and poor in 6. Four of the five patients with spreading appendical peritonitis with excellent responses did not require surgical intervention. Two deaths occurred, and one of these could be explained on the basis of concomitant disease rather than of antibiotic failure. In four patients the disease process failed to respond to adequate trials of intravenous terramycin therapy, but recovery followed administration of an alternate antibiotic.

Parenteral Nutrition.—One of the major problems in parenteral nutrition has been the provision of adequate calories without overhydration. Rice and associates discuss their experience with a parenteral solution that contains 1,000 calories per 1,000 cc. This approaches the physiologically normal proportion of calories to fluid, in that 2,500 calories and 2,500 cc. of fluid represent nearly the average daily requirement for the normal person. Commercial solutions of concentrated invert sugar and amino acids were used to prepare this solution. Invert sugar is an acid hydrolysate of cane sugar, yielding equal parts of glucose and fructose. Absolute ethyl alcohol was added to increase the caloric content. One liter of the solution contains 120 gm. (480 calories) of invert sugar, 60 gm. (240 calories) of amino acids, and 40 gm. (50 cc. and 280 calories) of ethanol. The authors use this solution in the postoperative period until the patient is able to consume adequate food or whenever a patient is in need of fluid or calories. Parenteral nutrition with this solution simplifies the calculation of the nutritional intake, because each cubic centimeter represents one calorie. A total of 543 liters of this solution was administered intravenously to 109 patients. The local reaction in the vein was not greater than when 5% glucose was given intravenously. A polyethylene tube was used to give greater comfort for the patient. Extravasation of the solution produced local redness and soreness but no slough. Continuous administration of this solution provided the full nutritional requirement without overhydration. Patients receiving this solution had a smooth convalescence. There was neither polyuria nor oliguria during the infusion, and the blood sugar level did not exceed the renal threshold. In two cases of biliary fistula this form of feeding seemed to diminish the secretion of bile and allow the irritated fistulous tract to heal. The method also offers a substitute for gastrostomy in patients who undergo resections of the mandible for carcinoma, and it is suitable also for patients who must be nourished through a gastrostomy. Adequate parenteral nutrition in the immediate postoperative period seems to aid the maintenance of a normal electrolyte level of the blood.

American Review of Tuberculosis, New York

65:111-220 (Feb.) 1952

Tuberculosis Attack and Death Rates of Household Associates: Influence of Age, Sex, Race, and Relationship. R. R. Puffer, L. D. Zeidberg, A. Dillon and others.—p. 111.
Disseminated Nodular Pulmonary Infiltrations of Indeterminate Nature in Apparently Healthy Persons. A. D. Chaves and H. Abeles.—p. 128.
Diffuse Pulmonary Granulomatosis in Young Women Following Exposure to Beryllium Compounds in Manufacture of Radio Tubes: Further Observations and Report of Nine Additional Cases. P. Slavin. —p. 142.
Simultaneous Pulmonary Resection and Thoracoplasty in Treatment of Pulmonary Tuberculosis. F. H. Ellis Jr., O. T. Clagett and D. T. Carr.—p. 159.
Prognosis of Tuberculous Meningitis. R. Debré.—p. 168.
Growth Pattern and Virulence of Tubercle Bacilli. D. Yegian and J. Kurung.—p. 181.
Use of Oxidation-Reduction Dyes in Determination of Virulence of Mycobacteria in Vitro. F. J. Wilson, C. Kalish and C. H. Fish.—p. 187.
Comparative Study of Hemagglutination Test for Antibodies and Its Hemolytic Modification in Tuberculosis. M. Mollov and T. J. Kott. —p. 194.
Effects of Simultaneous Skin Tests on Size of Tuberculin Reactions. C. Crumb, P. Meier and F. B. Seibert.—p. 201.

Periodicals on file in the Library of the American Medical Association may be borrowed by members of the Association or its student organization and by individual subscribers, provided they reside in continental United States or Canada. Requests for periodicals should be addressed "Library, American Medical Association." Periodical files cover only the last 11 years, and no photoduplication services are available. No charge is made to members, but the fee for other borrowers is 15 cents in stamps for each item. Only three periodicals may be borrowed at one time, and they must not be kept longer than five days. Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted.

Annals of Internal Medicine, Lancaster, Pa.

36:1-278 (Jan.) 1952

Reversibility of Certain Rheumatic and Nonrheumatic Conditions by Use of Cortisone or of Pituitary Adrenocorticotropic Hormone. P. S. Hench.—p. 1.
Role of Elastic Tissue in Formation of Arteriosclerotic Lesion. A. I. Lansing.—p. 39.
Phosphate Ester Poisoning, New Problem for the Internist. D. O. Hamblin and J. F. Marchand.—p. 50.
*Bacteroides Infections. L. V. McVay Jr. and D. H. Sprunt.—p. 56.
Therapy of Gonococcal Arthritis. P. O. Hagemann, A. Hendin, H. H. Lurie and M. Stein.—p. 77.
*Carcinoma of Body and Tail of Pancreas: Report of 37 Cases Studied at the State of Wisconsin General Hospital from 1925-1950. B. K. Smith and E. C. Albright.—p. 90.
Peptic Ulcer: Medical Cure by Efficient Gastric Acid Neutralization. N. E. Rossett, F. H. Knox Jr. and S. L. Stephenson Jr.—p. 98.
Recognition and Treatment of Hepatic Amebiasis. D. C. Zavala and H. E. Hamilton.—p. 110.
Myocardial Lesions in Subacute Bacterial Endocarditis. E. L. Perry, R. G. Fleming and J. E. Edwards.—p. 126.
Screening for Chest Pathology Using Mass X-Ray Survey Technic. G. H. Gowen and B. Frank.—p. 138.
Sinus Bradycardia in Acute Rheumatic Fever. J. G. Hirsch and D. M. Flett.—p. 146.
Old Age in the Bible and Poetry. L. A. M. Krause.—p. 152.

Bacteroides Infections.—During the past five years the authors have observed 35 patients between the ages of 7 months and 71 years with bacteroides infections. The portal of entry was the respiratory system in 6 patients, the gastrointestinal tract in 6, the female genital tract in 13, the urinary system in 7, the skin in 1, and the ear in 2. Twenty-one of these patients were critically ill and 11 died. Bacteroides organisms were the primary cause of death in nine, and were secondary invaders in the two other patients, who died of malignancy. Necropsies were performed on nine patients. During life most of the patients did not appear seriously ill. Patients who had temperatures as high as 106 F, with a marked leukocytosis, frequently presented minimal symptoms. The usual clinical picture was that of a pyogenic infection, with the dominating symptoms being determined by the portal of entry. The characteristic pathological lesion was localized suppuration similar to that caused by staphylococci, which occasionally invaded the blood stream, with subsequent bacteremia or septicemia and metastatic abscess formation. When the latter occurred, the patient became critically ill and the prognosis grave. In 22 cases Bacteroides were obtained in pure culture from blood, purulent material, urine, and cerebrospinal fluid; in 10 instances these organisms were associated with one to three other bacteria, and in 3 cases Bacteroides were obtained alone on one occasion but associated with another organism at another period. In view of the prolonged, debilitating, and often fatal outcome of many Bacteroides infections, early diagnosis and appropriate treatment are essential. In vitro and in vivo studies indicated that aureomycin may be the therapeutic agent of choice in these infections. When the oral route of administration cannot be utilized, aureomycin should be given intravenously. The importance of Bacteroides infections has been grossly underestimated. Improved laboratory facilities and a greater awareness on the part of physicians should lead to increasing recognition of the importance of Bacteroides infections in man.

Carcinoma of Body and Tail of the Pancreas.—Thirty-seven cases of carcinoma of the body and tail of the pancreas were studied in order to formulate a combination of signs and symptoms that may permit an early diagnosis. Of the 37 patients, 31 were men and 6 were women. The average age of the patients was 58.1 years. The average duration of the disease in the 24 patients followed to necropsy was 9.1 months. The correct diagnosis was made in only seven patients before laparotomy or autopsy, the common incorrect diagnosis being carcinoma of the colon. The commonest symptoms were abdominal pain, weight loss, anemia, nausea, vomiting, and constipation. Multiple venous thrombi were noted in eight patients, the femoral and iliac veins being commonly affected. Abdominal pain aggravated by the supine position and relieved by erect position were noted in 15 patients. Ascites was present in 12 patients, and in all of them liver metastases combined with peritoneal implants or portal vein thromboses were revealed by necropsy or laparotomy. Barium studies of the gastrointestinal tract revealed no abnormalities in the majority of cases. Because of the apparent difficulty of early diagnosis, early search for venous thrombi and thorough blood studies in regard to amylase, prothrombin, and clotting factors are urged. The combination of weight loss, anemia, constipation, venous thrombosis, and otherwise unexplained abdominal pain aggravated by the supine position should suggest immediately the possibility of carcinoma of the body of the pancreas.

Annals Otol., Rhin. and Laryngology, St. Louis

60:897-1196 (Dec.) 1951. **Partial Index**

Allergic Factor in Chronic Bronchopulmonary Infections. F. W. Davison.—p. 948.
Fish Bones in Esophagus. J. L. Goldman.—p. 957.
Formation of Otoliths. T. Vilstrup.—p. 974.
Lipoma of Larnyx. F. Harbert.—p. 982.
Adenoma of Ceruminous Glands. W. H. Brannon and G. E. Fisher.—p. 986.
Endonasal Schwannoma. M. Gonzalez Loza and E. Rosenzvit.—p. 988.
Hearing Aids: How They Work and for Whom. I. J. Hirsh.—p. 1032.
The Deaf and Hard of Hearing Child. C. O'Connor.—p. 1039.
Psychogenic Deafness and Its Detection. L. G. Doerfler.—p. 1045.
Anti Allergic Methods Used in Restoration of Hearing During Childhood. M. F. Jones, G. A. Sisson, R. J. Bellucci and F. C. Edmonds Jr.—p. 1085.
Effect of Cholesteatosis on Bone. T. E. Walsh, W. P. Covell and J. H. Ogura.—p. 1100.
Extra-Temporal Repair of Facial Nerve: Case Reports. J. H. Maxwell.—p. 1114.
Postural Vertigo and Positional Nystagmus. J. R. Lindsay.—p. 1134.
*Long-Term Results of Fenestration Surgery. H. P. House.—p. 1153.

Long-Term Results of Fenestration.—Complete records, including questionnaires and audiograms, were available for only 88 of 200 patients five or more years after they were subjected to the fenestration operation. Nearly two-thirds of these patients were pleased with the hearing result five years after the operation. All patients prior to the fenestration operation had lost serviceable hearing and should have been wearing a hearing aid. Five years after fenestration, 27% of the patients were wearing a hearing aid and an additional 17% stated that they felt the need of a hearing aid, a total of 44%. Conversely, 56% of the patients have satisfactory hearing without a hearing aid five years after fenestration.

Arizona Medicine, Phoenix

9:1-80 (Jan.) 1952

Surgical Treatment of Carcinoma of Colon and Rectum. J. Van Prohaska and M. C. Govostis.—p. 21.
Treatment of Skin Cancer. K. C. Sawyer and A. R. Woodburne.—p. 26.
Sporotrichosis (Report of Case). K. C. Baker and J. T. Malone.—p. 28.
What to Know About Modern Chest Surgery. R. M. Janes.—p. 29.

9:1-76 (Feb.) 1952

Anesthesiology and Its Practical Adaptation into General Medicine and Surgery. E. B. Tuohy.—p. 19.
Diagnosis and Treatment of Small Bowel Obstruction. M. W. Merrill.—p. 25.
Industrial Urology. P. L. Singer.—p. 31.

Diabetes, New York

1:1-86 (Jan.-Feb.) 1952

Salute to Diabetes. E. P. Joslin.—p. 1.
Endocrine Control of Blood Sugar. C. N. H. Long.—p. 3.
Proper Use of Laboratory Tests in Diagnosis and Management of Diabetes. F. D. W. Lukens.—p. 12.
Hyperglycemia in Coronary Thrombosis. M. Ellenberg, K. E. Osserman and H. Pollack.—p. 16.
Dermal Reactions to Insulin Therapy. R. G. Paley and R. E. Tunbridge.—p. 22.
Serum and Urinary Proteins in Diabetic Glomerulosclerosis: Results of Electrophoretic Analysis. H. Rifkin and M. L. Petermann.—p. 28.
Controlled Versus Free Diet Management of Diabetes. J. L. Wilson, H. F. Root and A. Marble.—p. 33.
*Pituitary Necrosis in Diabetic During Pregnancy: Houssay Phenomenon in Man. F. W. Williams.—p. 37.

Houssay Phenomenon in Man.—The occurrence of pituitary necrosis is reported in a diabetic woman, aged 27, in the third month of pregnancy. Prior to her admission to the hospital the patient had repeated episodes of hypoglycemia despite reduction of the daily insulin dosage from 60 to 15 units. On admission to the hospital she was unconscious and must have been in this state for 12 hours. After the rapid, intravenous administration of 3,400 cc. of dextrose, her urine had become sugar-free, but two hours later it contained sugar (4+) and a trace of acetone. She then was given 10 units of regular insulin with an infusion of dextrose, and in response to this treatment the urine again became sugar and acetone-free. Because of the repeated hypoglycemia before admission, the need for huge doses of dextrose intravenously in the hospital, and the sharp response to 10 units of regular insulin, the possibility of loss of pituitary function was considered when the patient died 37 hours after admission, without regaining consciousness. At necropsy the pituitary was twice the normal size, and a large part of the gland had been destroyed by hemorrhage. Pituitary necrosis had resulted in intractable hypoglycemia with extreme sensitivity to insulin, and finally in death. The condition can be compared to the situation produced experimentally by the animal experiments of Houssay, in which he removed both the pancreas and the pituitary. The evidence presented in the author's case appears to justify the conclusion that it represents one of the few recorded examples of the Houssay phenomenon in man.

Endocrinology, Springfield, Ill.

50:1-142 (Jan.) 1952. **Partial Index**

Comparative Value of Cortisone, 17-Hydroxycorticosterone and Adrenal Cortex Extract Given by Continuous Intravenous Injection in Sustaining Ability of Adrenalectomized Rat to Work. D. J. Ingle, J. E. Nezamis and E. H. Morley.—p. 1.
Demonstration of Non-Estrogenic Uterine Stimulating and Estrogen Augmenting Substance in Pregnant Mares' Urine. H. Cohen and R. W. Bates.—p. 5.
Relation of Some Steroid Hormones to Beta-Glucuronidase Activity. E. Knobil.—p. 16.
Effect of a-Estradiol, Some of Its Esters and Estrone on Respiration of Tissue Homogenates. M. A. Guidry, A. Segaloff and A. M. Altschul. —p. 29.
Changes in Adenosine Triphosphate and Creatine Phosphate Content of Rabbit Uterus Throughout Sexual Maturation and After Ovulation. J. H. Menkes and A. Csapo.—p. 37.
Influence of Cortisone on Renal Function and Electrolyte Excretion in Adrenalectomized Dog. K. E. Roberts and R. F. Pitts.—p. 51.
Intravaginal Assay of Estrogens. F. G. Sulman.—p. 61.
Effect of Epinephrine and Thyrotropin on Thyroid Function in Rats. A. L. Botkin and H. Jensen.—p. 68.
Some Studies on Oxidative Metabolism of Adrenal Gland. T. L. Sourkes and P. Heneage.—p. 73.
Reciprocal Relation Between Hypophysis and Adrenals in Fetal Rats: Effects of Unilateral Adrenalectomy and of Implanted Cortisone, DOCA and Sex Hormones. R. L. Kitchell and L. J. Wells.—p. 83.
Diabetogenic Effect of Growth Hormone in Intact Force-Fed Adrenocorticotrophin Treated Rat. F. L. Engel, A. Viau, W. Coggins and W. S. Lynn Jr.—p. 100.
Myxedema in Radiothyroidectomized Dog. R. C. Goldberg and I. L. Chaikoff.—p. 115.
I^{131} Distribution in Normal and Hemithyroidectomized Rats Treated with Desoxycorticosterone Acetate. J. B. Boatman, C. Russ, J. H. Sunder and others.—p. 134.

Geriatrics, Minneapolis

7:1-86 (Jan.-Feb.) 1952

Operative Treatment of Degenerative Arthritis of Hip. F. C. Reynolds and J. A. Key.—p. 1.
Use of Digitalis in the Aged. M. J. Raisbeck.—p. 12.
Hypothyroidism: Geriatric Problem. S. T. Kimble and E. J. Stieglitz. —p. 20.
Scope of Cytology in Cancer Diagnosis. J. F. Seybolt.—p. 32.
Dietary Cholesterol and Atherosclerosis. E. Tuttle.—p. 37.
Atypical Systemic Amyloidosis Associated with Senile Gangrene. R. Love. —p. 42.
Clinical Evaluation of Psychiatric Disorders in the Aged. L. Tilkin. —p. 56.
Report on Current Trends in Arteriosclerosis Research. O. J. Pollak. —p. 59.

GP (J. Am. Acad. Gen. Practice), Kansas City, Mo.

5:1-222 (Feb.) 1952

How to Diagnose and Treat Gout. L. M. C. Kelly.—p. 34.
Psychiatric Method in General Practice. S. Wolf.—p. 43.
Facial Injuries. D. L. Murphy, E. S. Murphy and W. A. McNichols. —p. 47.
The Pneumonias. H. F. Dowling.—p. 53.
Breast Tumors. S. Leo.—p. 61.
The Antibiotics—Uses and Abuses. P. S. Rhoads.—p. 66.

International Journal of Leprosy, New Orleans

19:395-530 (Oct.-Dec.) 1951

Clinical and Laboratory Study of Leprosy in Liberia. H. A. Poindexter. —p. 395.
Leprosy in New Calconia and Its Dependencies. E. Ragusin.—p. 413.
Treatment of Leprosy with Propiosulfone. G. Herrera.—p. 423.
*Treatment of Leprosy with Conteben. E. Keil.—p. 437.
Studies on Serum Proteins in Leprosy: Alpha, Beta and Gamma Globulin Fractions. Sister Hilary Ross and F. Gemar.—p. 445.

Amithiozone in Leprosy.—Keil points out that the almost identical morphological and staining properties of tubercle and leprosy bacilli suggest a close biological relationship of these acid-fast micro-organisms. The diseases caused by these organisms also have certain factors in common, and so it seems logical that drugs that have proved of value in one may also be effective in the other disease. This reasoning led investigators in several countries to try amithiozone (conteben®) in leprosy after this drug had proved of value in the treatment of tuberculosis. It appears that small doses of amithiozone are most effective at the beginning of treatment. An initial dose of 25 to 50 mg. per day has been recommended. The daily dose is then raised to 100 mg. or a maximum of 150 mg., according to the form and stage of the disease and the tolerance of the patient. A daily dose of 150 mg. should not be exceeded, even with good tolerance. The disadvantages of overdosage are more serious than those of inadequate dosage. The impression was gained that the favorable effects of amithiozone appear more rapidly than those of the sulfones and that this agent is tolerated better.

Journal of Bone and Joint Surgery, Boston

34A:1-248 (Jan.) 1952. **Partial Index**

*Local Stimulation of Growth of Long Bones: Preliminary Report. C. N. Pease.—p. 1.
Legg-Perthes Disease: Evaluation of Treatment by Traction and Ischial Weight-Bearing Brace. C. H. Herndon and C. H. Heyman.—p. 25.
Prophylaxis of Scoliosis. A. M. Arkin.—p. 47.
Fascial Arthroplasty of Knee. A. Miller and B. Friedman.—p. 55.
Arthrodesis of Wrist: Preliminary Report of New Method. R. F. Robinson and D. O. Kayfetz.—p. 64.
*Osteomyelitis in Infants. D. W. Blanche.—p. 71.
Intramedullary Fixation of Tibia. F. vom Saal.—p. 86.
Fractures Involving Distal Femoral Epiphyseal Cartilage. A. P. Aitken and H. L. Magill.—p. 96.
Reduction of Anterior Dislocations of Shoulder by Means of Milch Abduction Technique. T. Lacey II and H. B. Crawford.—p. 108.
Senescent Human Vertebra: Contribution to Human Osteogeny. III. E. M. Bick and J. W. Copel.—p. 110.
Orthograms of Posture. C. W. Goff.—p. 115.
Arthrodesis of First Metatarsophalangeal Joint for Hallux Valgus, Hallux Rigidus, and Metatarsus Primus Varus. D. C. McKeever.—p. 129.
Unusual Form of Osteo-Arthropathy Present Bilaterally in Knees of Two Brothers. J. D. Rogers and W. H. Bickel.—p. 135.
Osteochondritis Dissecans with Spontaeous Healing. R. E. Van Demark. —p. 143.
Scoliosis Complicated by Paraplegia. S. Kleinberg and A: Kaplan. —p. 162.
End-Result Study of Various Operative Procedures for Correcting Flat Feet in Children. C. H. Crego Jr. and L. T. Ford.—p. 183.
Transplantation of Semitendinosus for Repair of Laceration of Medial Collateral Ligament of Knee. D. M. Bosworth.—p. 196.

Local Stimulation of Growth of Long Bones.—Differences in limb length in children have been treated by arrest of growth of the longer bone or stimulation of growth in the shorter. Pease describes his technique for local stimulation of bone growth by insertion of ivory screws near the epiphyseal cartilage. Daily for one month prior to the operation, a teaspoonful to a tablespoonful of phosphorized cod liver oil is given to the child, the dosage depending upon the age. Ivory screws or pieces of ivory are sterilized by being placed in 95% alcohol and autoclaved under 15 lb. (6.8 kg.) of pressure for one hour. After a lateral longitudinal incision has been made at the end of the bone, just enough of the periosteum is stripped to permit drilling the holes. Although the incision is made in the epiphyseal plate region, it is not only unnecessary to expose the cartilage but it is recommended that the plate be avoided. Not one complication has arisen from this approach, but too much trauma at the site of the epiphyseal plate may arrest growth. The drill should be at least 1/64 in. (0.25 cm.) smaller than the screw. After the depth of the drill hole has been determined, a mark is made on the proximal portion of the screw to indicate how far the screw must be driven into the bone in order that its distal end will extend just through the opposite cortex. The remaining proximal portion of the screw is then cut off flush with the cortex. Seven patients on whom this operation was performed have been followed for 6 months to 12 years. In five the growth retardation of the bone was due to poliomyelitis, in one to congenital hypoplasia, and in one to a congenital dislocation of the hip, with associated hypoplasia of the femur. A secondary operation was performed in two cases five and three years after the initial procedure. Stimulation of growth followed operation in all cases. No severe deformities occurred, but if they had, an osteotomy would afford additional length and at the same time produce further stimulation of longitudinal growth. Acceleration of bone growth occurred in four patients with poliomyelitis three, four, five, and six years after onset of the disease, coincident with growth-stimulating procedures. This suggests that the cells in the cartilage columns of the epiphyseal plates have not undergone degenerative changes during these periods. Much remains to be learned about bone growth in children. From the conflicting reports on the results of growth stimulation in animals, it is obvious that animal experimentation is not a reliable tool for study of growth stimulation of long bones.

Osteomyelitis in Infants.—The highest incidence of acute hematogenous osteomyelitis was formerly in the 10-year-old age group, but the peak incidence in recent years has been in infants less than one year old. Blanche reviews observations on 25 children less than 1 year old who were treated for hematogenous osteomyelitis diagnosed bacteriologically. Twenty-three were under 2 months of age on admission. The outstanding local symptoms were swelling and loss of function of an extremity. In 13 cases a single bone was involved. The total number of bone foci was 50; 22 were in the femur, and 16 at the proximal end, with associated pyarthrosis of the hip in 11 cases. Seven were in the humerus, mostly in the proximal end, and five were in the tibia. The infecting organism was isolated either from the local lesion, from blood culture, or from both; staphylococcus was isolated in pure culture in 21 cases. The 17 patients treated since 1944 received penicillin and 3 of the 8 treated previous to that time were given sulfonamides. There was complete recovery except for slight bone thickening in 10 patients. In eight cases there was major deformity of a crippling nature resulting from destruction of the epiphyseal plate, or of the epiphysis with disruption of the joint. The hip joint became septic in 11 of the 16 cases in which the proximal portion of the femur was involved. These patients were all treated by simple surgical drainage, usually followed by traction or application of a cast. The authors stress that the correct diagnosis of acute hematogenous osteomyelitis is often made late, after joint components and growth centers have been irreparably damaged. Normal temperature and absence of general reaction to infection may be misleading. This disease should be suspected if an infant becomes irritable and if swelling, tenderness, or loss of function of an extremity develop. The intra-articular tension and lytic action of pyogenic exudate in pyarthrosis of the hip rapidly destroy cartilage, thus causing disruption of the joint, dislocation, and growth disturbances. In dislocated hips that were observed later at open operation it was found that internal rotation was necessary to place the remaining elements of the proximal end of the femur into the acetabulum. The chief fault in present day treatment is delay of surgical drainage of localized abscesses, particularly when a hip joint is involved.

Journal of Neurophysiology, Springfield, Ill.

15:1-84 (Jan.) 1952

Ipsilateral Facial Representation in Motor Cortex of Macaque. E. W. Lauer.—p. 1.
Cortical Response to Stimulation of Lateral Geniculate Body and Potentiation Thereof by Continuous Illumination of Retina. Hsiang-Tung Chang.—p. 5.
Cerebro-Cerebellar Relationships in Monkey. R. S. Snider and E. Eldred. —p. 27.
Does Injury to Axon Promptly Induce Altered Excitability in Its Cell of Origin? B. Renshaw and H. E. Rosenbaum.—p. 41.
Levels of Integration of Respiratory Patterns. H. E. Hoff and C. G. Breckenridge.—p. 47.
Influence of Morphine on Respiratory Patterns. C. G. Breckenridge and H. E. Hoff.—p. 57.
Studies on Intraretinal Action Potential with Low-Resistance Microelectrode. T. Tomita and A. Funaishi.—p. 75.

New Orleans Medical and Surgical Journal

104:297-342 (Feb.) 1952

Emotional Factors in Childhood Diseases. J. M. Baty.—p. 297.
Psychotherapist. R. A. Matthews.—p. 301.
Treatment of Mild Knock Knees and Pronated Feet in Childhood: Results in 63 Cases. G. A. Caldwell, R. L. Shorkey and T. L. Duncan.—p. 304.
Clinical Significance of Minor Inequalities in Leg Length. I. Redler. —p. 308.
Cortisone and ACTH in Dermatologic States. C. B. Kennedy, V. M. Henington, H. C. Cope and W. H. Hamilton.—p. 312.
Local Use of Cortisone Acetate in Eye Disease. L. A. Breffeilh.—p. 321.
Frontal Headache. H. D. Odgen.—p. 326.

Ohio State Medical Journal, Columbus

48:97-192 (Feb.) 1952

Use of Tracheotomy on General Surgical Service. W. Furste.—p. 117.
Strictures—Bile Ducts. W. E. Neville—p. 121.
Diagnostic Value of Tuberculin Test in Tuberculosis. O. Neufeld and W. L. Wallbank.—p. 124.
Clinical Approach to Senile Osteoporosis. R. H. Schoene.—p. 126.
Rural Clinics for Children with Heart Disease. R. A. Lyon and L. W. Rauh.—p. 130.
Cystosarcoma Phyllodes: Report of Case. E. M. Fusco.—p. 134.
Care of Vagina and Cervix in Pregnancy. C. H. Hendricks.—p. 136.

Pediatrics, Springfield, Ill.

9:1-140 (Jan.) 1952

Chronic Eosinophilia Due to Visceral Larva Migrans: Report of Three Cases. P. C. Beaver, C. H. Snyder, G. M. Carrera and others.—p. 7.
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*Adrenocorticotropic Hormone in Therapy of Retrolental Fibroplasia. J. T. Lanman, L. P. Guy and J. Dancis.—p. 27.
Butanol-Extractable Iodine in Serum of Infants. E. B. Man, D. E. Pickering, J. Walker and R. E. Cooke.—p. 32.
Blood Sugar and Citric Acid Levels in Newborn Infants. I. F. Gittleman and J. B. Pincus.—p. 38.
Familial Parosyxmal Choreoathetosis of Mount and Reback: Study of Second Family in Which This Condition Is Found in Association with Epilepsy. C. V. Pryles, S. Livingston and F. R. Ford.—p. 44.
Congenital and Infantile Aphasia: Review of Literature and Report of Case. D. W. Van Gelder, L. Kennedy and J. Laguaite.—p. 48.
Gynecomastia with Pigmentation in a Four Year Old Male Following Stilbestrol Exposure. M. Prouty.—p. 55.
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Unilateral Paralysis of Diaphragm in the Newborn Infant Due to Phrenic Nerve Injury, With and Without Associated Brachial Palsy. N. Schifrin.—p. 69.
Pre- and Postoperative Growth Patterns in Congenital Heart Disease as Shown by Wetzel Grid. M. R. Richards.—p. 77.
Nutritional Quality of Milk Thermally Modified to Reduce Allergic Reaction. R. M. Tomarelli, E. Linden and F. W. Bernhart.—p. 89.
Congenital Dislocation of Hip. L. G. Pray.—p. 94.
Pseudomonas Meningitis in Infant Successfully Treated with Neomycin. S. Ditkowdky, A. Goldman and M. Goldin.—p. 101.

Adrenocorticotropic Hormone in Retrolental Fibroplasia.—All infants entering the premature unit of Bellevue Hospital with retrolental fibroplasia were divided into a corticotropin-treated group and a control group by random selection. Five infants were treated with corticotropin and four were not. Corticotropin therapy was begun between the 7th and 37th day of life, and was given for from 30 to 66 days. The usual daily dose ranged from 20 to 40 mg.; lower dosages were given in three cases during a part of the therapeutic period. The total amount received ranged from 650 to 1,835 mg. These doses were sufficient to cause physiological changes, including a rise in the urinary formaldehydogenic steroid output; reduction of the circulating eosinophils, usually to zero; cutaneous pigmentation; rounding of the face; transient and usually minimal edema; and in the three patients in whom observations were made, hyperglycemia and glycosuria. One of the five infants treated died during therapy. Each of the four surviving infants developed extensive scar tissue behind the lens. This uniformity of therapeutic failure indicates that corticotropin as employed in this study is not an effective therapeutic agent in retrolental fibroplasia. The hazards of corticotropin treatment are evident in the side-effects noted in each case and emphasized by the death of one infant.

Pennsylvania Medical Journal, Harrisburg

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Progress Report on ACTH and Cortisone. T. R. van Dellen.—p. 94.
Bleeding During Pregnancy. W. M. Allen.—p. 101.
Some Psychologic Processes in Consultation Room. J. A. M. Meerloo.—p. 107.
Sickle Cell Anemia and Pregnancy. R. Charet, R. Waltman and H. Fernbach.—p. 111.
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Fundamentals of Pathology as Illustrated in Captive Wild Animals. R. E. Rewell.—p. 126.

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Effect of Cell Concentration on Oxygen Consumption of Leukocytes Under Varying Conditions. J. D. Hartman.—p. 3.
Use of Guinea Pig Eye in Study of Intraocular Infections Produced by Mumps Virus. V. S. Bolin and G. R. Leymaster.—p. 7.
Adrenocorticotrophic Hormone: Stability Studies. B. N. Ghosh, E. L. Smith and G. Sayers.—p. 23.
Potentiation by Adrenaline of Protective Effect of Cortisone on Histamine Toxicity in Adrenalectomized Mice. B. N. Halpern, B. Benacerraf and M. Briot.—p. 37.
Nucleic Acid Metabolism of Bone Marrow and Spleen. I. Normal Values and Effect of Sodium Pentobarbital. W. A. Rambach, D. R. Moomaw, H. L. Alt and J. A. D. Cooper.—p. 59.
Influence of Cortisone upon Acute Inflammation. V. H. Moon and G. A. Tershakovec.—p. 63.
Effect of Anti-Rheumatic Drugs on Synovial Membrane Permeability. W. D. Paul, R. E. Hodges, R. W. Knouse and C. S. Wright Jr.—p. 68.
Mechanism of Hypotensive Action of Veratrum Alkaloids. A. P. Richardson, H. A. Walker, C. B. Farrar and others.—p. 79.
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Concentration of Hyperglycemic Factor from Urine of Schizophrenics. M. S. Morgan and F. J. Pilgrim.—p. 106.
Comparison of Biologic Effects of ACTH Protein and ACTH Peptide Given by Continuous Injection. D. J. Ingle and Choh Hao Li.—p. 128.
Is Hypoprothrombinemia Caused by Deficiency of Vitamin K Different from that of Dicumarol? A. J. Quick, C. V. Hussey and G. E. Collentine.—p. 131.
Saphenous Circulation Time Test with Radioactive Tracer. H. T. Zankel and R. Clark.—p. 135.
Antifungal Properties of Polymyxins. H. J. Florestano and M. E. Bahler.—p. 141.
*Production of Positive Antiglobulin Serum Test in Rabbits by Intraperitoneal Injection of Homologous Blood. Chi Kong Liu and R. S. Evans.—p. 194.

Positive Antiglobulin Serum Test.—Studies of acquired hemolytic anemia indicate that the red cell sensitizing agent is a fraction of plasma protein similar in many ways to isoantibodies, but it is not known what conditions are necessary for its production. Since it appears to be an antibody specific for human red cells, attempts to produce the disease experimentally should include attempts to sensitize the animal to an antigen in autologous red cells. During a study of a patient with anemia secondary to intraperitoneal bleeding from a ruptured ectopic pregnancy, a transient positive antiglobulin test was observed. An effort was made to simulate this occurrence in animal experiments. Three of 12 rabbits receiving repeated intraperitoneal injections of their own blood immediately after removal from the heart developed a transiently positive antiglobulin serum test (Coombs' test) with a reagent made by injecting rabbit serum into guinea pigs. The authors suggest the relatively bland treatment of the red cells may have modified their surface structure sufficiently to provoke antibody production. None of the three developed evidence of a hemolytic anemia. Rabbits receiving injections of rabbit red cell stroma that had been incubated with bacterial filtrate or emulsions of rabbit liver or kidney failed to develop positive agglutination tests with the same reagent.

Surgery, St. Louis

31:1-166 (Jan.) 1952

Diseases of Superior Vena Caval System with Special Consideration of Pathology and Diagnosis. J. R. Veal and N. J. Cotsonas Jr.—p. 1.
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*Silicone-Tube Coagulation Time as Aid in Diagnosis of Phlebothrombosis. R. S. McCleery, J. A. Yarborough and M. G. Weidner Jr.—p. 28.
*Spontaneous Thrombophlebitis. P. T. DeCamp, R. M. Landry, A. Ochsner and M. E. DeBakey.—p. 43.
Effect of Venous Occlusion on Arterial Blood Flow in Extremities: Experimental Study. J. E. Thompson and J. R. Vane.—p. 55.
Observations on Direct Effect of Cold on Blood Vessels in Human Extremity and Its Relation to Peripheral Vascular Disease. J. L. Buchanan, J. J. Cranley Jr. and R. R. Linton.—p. 62.
Critique of Laboratory Methods in Peripheral Vascular Disease. J. J. Cranley Jr., J. L. Buchanan, F. A. Simeone and R. R. Linton.—p. 74.
Direct and Retrograde Aortography. R. A. Deterling Jr.—p. 88.
Regional Heparinization After Thromboendarterectomy in Treatment of Obliterative Arterial Disease: Preliminary Report Based on 12 Cases. N. E. Freeman and R. S. Gilfillan.—p. 115.
Transmetatarsal Amputation in Arterial Deficiency of Lower Extremity. R. Warren, E. S. Crawford, I. B. Hardy and J. B. McKittrick.—p. 132.
Growth of Preserved Aorta Homografts: Experimental Study. J. Johnson, C. K. Kirby and R. C. Horn.—p. 141.
Experimental Cardiac Surgery: III. Coronary Blood Flow as Measured Directly with Caval Venous Return Shunted Past the Right Heart. F. B. Maraist and W. W. L. Glenn.—p. 146.
Maintenance of Life by Homologous Lungs and Mechanical Circulation. W. J. Potts, W. L. Riker, R. DeBord and C. E. Andrews.—p. 161.

Silicone-Tube Coagulation Time in Phlebothrombosis.—Discussing the difficulties encountered in finding an objective test that would accurately differentiate patients who are likely to develop phlebothrombosis following surgical procedures, McCleery and his associates point out that, if the unphysiological effect of glass on the blood coagulation time could be minimized, then a simple coagulation time method might have merit. Ideally, one should use glass test tubes lined with a nontraumatized vein wall. It has been shown that this goal can be partially approached by coating glass test tubes with silicone solutions. Two and one-half years ago the authors began preoperative and daily postoperative coagulation time determinations with silicone-coated tubes. They selected 273 patients likely to develop phlebothrombosis. Fibrinogen B, prothrombin time, Lee-White coagulation time, and blood viscosity were also determined daily on many of these patients. Eighteen of these patients developed evidence of phlebothrombosis while under observation. All of these had coagulation times below 45 minutes, whereas none of the other 255 patients had any postoperative clotting time that low. Other postoperative patients not in the group were spot-checked if they developed questionable signs. Patients having a positive test were given treatment. That the false positive rate must have been extremely low is substantiated by an incidence of only 0.7% phlebothrombosis in the 4,836 patients operated upon during the period of this study. An intensive follow-up study of over 90% of 290 patients with negative test results failed to reveal a single false negative result. Of all the tests performed, only the silicone-tube coagulation time seemed to be significant. Although the latter had no prognostic value, it did appear to have real merit in the clinical diagnosis of early cases of phlebothrombosis and pulmonary embolism.

Spontaneous Thrombophlebitis.—Venous thrombosis is commonly considered merely as a complication of other disorders. This paper, however, presents observations on 90 apparently healthy individuals in whom thrombophlebitis occurred without being preceded by infection, trauma, heart failure, cancer, operation, or other precipitating episodes. These cases were observed at two New Orleans hospitals over periods of 10 and 12 years, respectively. At one of these institutions the cases of spontaneous thrombophlebitis represented 4.5% of the entire series of 1,223 cases of acute venous thrombosis or pulmonary embolism. The clinical picture of spontaneous thrombophlebitis closely resembles similar types of phlebitis occurring secondary to some other condition. In spontaneous cases there is a relatively high incidence of involvement of the right lower extremity, of superficial phlebitis, and of recurrence. Thromboembolic disease of the venous system is protean in its manifestations, but the clinical picture is similar whether the disease occurs as a primary phenomenon or following some [illegible] episode. For this reason, it should be considered as a disease entity and not merely as a complicating feature of [illegible]

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Acta Path. et Microbiol. Scand., Copenhagen

29:345-472 (No. 4) 1951. **Partial Index**

*Combined Effect of Streptomycin and Penicillin, Streptomycin and Sulfatiazole, and Streptomycin and *p*-Aminosalicylic Acid (PAS) on Tubercle Bacilli. E. Espersen.—p. 350.

Incidence of Penicillin-Resistant Pathogenic Staphylococci Isolated from Upper Respiratory Tract of Healthy Young Persons. Th. M. Vogelsang. —p. 363.

Investigation of Passage of Dihydrostreptomycin from Blood into Cerebrospinal Fluid in Lymphocytic Meningitis. J. Lenstrup.—p. 379.

Studies on Haemophilus Influenzae: Biochemical Activities. G. Tunevall. —p. 387.

Influence of Estrogenic Hormones on Prostate: Estrogenic Reactions in Human Prostate After Artificial Hormone Administration, in Normal Human Prostate at Birth, and in Cases of Senile Hyperplasia of Prostate. A. H. I. Jakobsen.—p. 419.

Insulomas. V. Eskelund.—p. 426.

*Effect of Ice Water upon Development of Skin Lesions Due to Mustard Gas in Rabbits. O. E. Hansen and L. Kreyberg.—p. 468.

Combined Effect of Streptomycin and Other Antibacterials on Tubercle Bacilli in Vitro.—Since streptomycin is frequently used with other antibacterial remedies in the treatment of tuberculosis, the combined effects of streptomycin and other drugs were investigated in vitro on tubercle bacilli. The studies were carried out on the E$_5$ strain of human tubercle bacilli in fluid Dubos' medium. It was found that in Dubos' medium there is a pronounced synergistic effect of streptomycin and penicillin on growth of tubercle bacilli; 1/32 unit of streptomycin plus 40 units pencillin per milliliter produces complete inhibition. Streptomycin plus sulfathiazole also has a synergistic effect, and 1/32 unit of streptomycin plus 5 mg. sulfathiazole effects complete inhibition. Streptomycin plus *p*-aminosalicylic acid has a synergistic effect, and 1/32 unit of streptomycin plus 0.25 mg. of *p*-aminosalicylic acid completely inhibits growth.

Effect of Ice Water on Skin Lesions from Mustard Gas.—The local as well as the general injuries due to mustard gas are severer in hot than in temperate climates. The explanation is probably that perspiration as well as the high temperature facilitates penetration of the mustard gas into the skin and the general circulation. Hansen and Kreyberg investigated the protective effect of cold against mustard gas, since in Norway cold water, ice, or snow is available for about half of the year. Four series of experiments on rabbits are described, which show that cooling reduces the skin damage produced by the application of 2% solution of mustard gas. The reduction is greatest when the exposed area is in direct contact with the ice water. The reduced damage in the cooled tissue surrounded by water can probably be explained by the fact that cooling reduces the absorption, and thereby facilitates washing away of a part of the mustard gas before it penetrates into the skin.

British Journal of Ophthalmology, London

36:1-56 (Jan.) 1952

*Pituitary Exophthalmos: Assessment of Methods of Treatment. K. Hermann.—p. 1.

Proptosis Caused by Lipoidosis. A. B. Handousa.—p. 20.

Partial Transplantation of Levator Palpebrae Superioris in Superior Rectus Palsy. H. B. Stallard.—p. 26.

Preliminary Report on Use of Methonium Compounds and General Anaesthesia in Ophthalmic Surgery. B. W. Rycroft and G. J. Romanes. —p. 29.

Anatomical Study of Retinal Circulation. J. François.—p. 37.

Circulation of Aqueous Humour and Experimental Determination of Its Rate of Flow. E. J. Ross.—p. 41.

Pituitary Exophthalmos.—Progressive edematous exophthalmos of proptosis with paralysis of the eye muscles is due to excess pituitary thyrotropic hormone, and its development is favored by thyroid deficiency. Thyroidectomy and the use of antithyroid substances are contraindicated even when there is a simultaneous hyperthyroidism because they might further stimulate the pituitary and increase the danger to the eyes. Failure of the hyperactive thyroid to depress pituitary thyrotropic activity differentiates this condition from acute Graves' disease, in which the output of thyrotropic hormone is known to be low. Radiation of the pituitary combined with local surgical measures to protect the eyes is the treatment of choice. In a series of 12 patients no further progression of the malady occurred after radiation, and the final result was either wholly or reasonably satisfactory. Dosage ranged from 3,000 to 5,000 r, delivered over periods of from 10 to 61 days. Ophthalmoplegia may persist if the changes in the muscles have become irreversible; the duration of diplopia and the severity of muscular defect before treatment determine the prognosis. Damage to the eye from corneal exposure may be avoided by tarsorrhaphy; if intraorbital pressure is rising rapidly, orbital decompression must also be carried out. Improvement in general health and diminution of thyrotoxic symptoms followed x-ray treatment of the pituitary in patients with concomitant hyperthyroidism.

British Journal of Radiology, London

25:1-56 (Jan.) 1952. **Partial Index**

Multiple Cystic Tuberculosis: Review and Revised Nomenclature. C. Komins.—p. 1.

Two Techniques for Treatment of Non-Malignant Lesions of Eye by X Rays. R. J. Walton.—p. 9.

Potential Source of Danger: Emission of X Rays from Rectifying Valves in X-ray Therapy Units. R. E. Ellis and L. H. S. Clark.—p. 17.

Cystogastrocolic Band: Radiological Considerations. E. Samuel.—p. 19.

Technique for Paediatric Bronchography. H. M. Wood and R. Astley. —p. 22.

Some Data on Normal Variation of Stomach Observed Radiologically. H. Jungmann and P. Venning.—p. 25.

SYMPOSIUM ON RADIATION HISTOLOGY

I. Limitations of Histology in Prognosis of Radiation-Treated Cancer. G. Gricouroff.—p. 35.

II. Response of Human Tissues to Radiation with Special Reference to Differentiation. A. Glücksmann.—p. 38.

III. Regeneration and -SH Changes in Guinea Pig Skin After X-Ray Treatment. J. Frederic.—p. 43.

IV. Systemic Enzyme Changes Induced by Radiation Therapy of Malignant Tumours. P. M. West.—p. 44.

British Medical Journal, London

1:175-230 (Jan. 26) 1952

Generalized Osteoarthritis and Heberden's Nodes. J. H. Kellgren and R. Moore.—p. 181.

Cortisone and A.C.T.H. in Treatment of Ankylosing Spondylitis. F. D. Hart.—p. 188.

Psychiatric Study of Six Cases of Infantile Acrodynia. D. Leys and K. Cameron.—p. 191.

Amino-Aciduria in Galactosaemia. A. Holzel, G. M. Komrower and V. K. Wilson.—p. 194.

Extensive Resection of Small Intestine: Short Review, with Two New Cases. H. J. Croot.—p. 195.

Orchitis in Bornholm Disease. R. J. G. Morrison and J. P. Baird.—p. 198.

"Trigger-Thumb" Simulating Paralysis: Report of Two Cases. A. Zinovieff.—p. 199.

1:231-286 (Feb. 2) 1952

*Treatment of Embolism and Thrombosis of Cerebral Vessels. R. Leriche. —p. 231.

Further Observations upon Diagnosis of Deafness in Young Children, with Particular Reference to Making of Recommendations for Special Educational Treatment. M. R. Dix and C. S. Hallpike.—p. 235.

Habitual Abortion: Further Observations on Prophylactic Value of Progesterone Pellet Implantation. P. M. F. Bishop and N. A. Richards. —p. 244.

Acute Polyarthritis with Pulmonary Consolidation and Pleural Effusion. A. W. Lees.—p. 246.

*Duration of Action of Different Insulins. F. Gerritzen.—p. 249.

Treatment of Hypertension by Oral Methonium Compounds. A. J. M. Campbell, J. G. Graham and R. D. H. Maxwell.—p. 251.

M. & B. 1863, Homologue of Hexamethonium, in Treatment of Hypertension. S. Locket, P. G. Swann, W. S. M. Grieve and H. P. Player. —p. 254.

Treatment of Cerebral Embolism and Thrombosis.—Leriche describes his experience with several procedures designed to improve cerebral circulation in cases of cerebral embolism and thrombosis. These procedures are based on the theory that localized spasm of the small cerebral arteries always accompanies embolism or thrombosis, that this produces a perifocal zone of functional ischemia, and that the ischemia can be relieved by interruption of sympathetic nerve impulses to these vessels. In support of this theory Leriche cites the histories of two patients with hemiplegia and aphasia following traumatic thrombosis or stenosis of the carotid artery, who improved dramatically following stellate ganglion block and pericarotid sympathectomy or resection of the thrombosed carotid artery. Other patients with hemiplegia improved considerably following stellectomy or section of the communicating branches of the cervical sympathetic chain. Infiltration of the stellate ganglion also produced remarkable improvement in hemiplegia due to birth trauma and in early cerebral vascular accidents. Infiltration should be performed as early as possible on the side opposite the paralysis, beginning with 10 cc. of 1% procaine solution. Six hours later 20 cc. should be injected, followed by 20 cc. daily for 15 days. There seems to be some advantage in occasionally giving the injection on the side of the paralysis and even in associating lumbar infiltration with stellate ganglion block. Sympathectomy is not necessary in early cases, and should be reserved for patients with a poor prognosis who have had repeated vascular accidents. Leriche prefers section of the vertebral nerve roots at the upper pole of the stellate ganglion rather than ganglionectomy, since the former procedure interrupts most of the constrictor fibers to the basilar artery. In some cases of hemiplegia of several years' duration he has obtained favorable results with repeated stellate ganglion blocks.

Action of Different Insulins.—This investigation was undertaken to compare different insulins under the same experimental conditions, and to ascertain the duration and character of their action. The subjects were young healthy student volunteers, whose blood sugar was investigated under standardized conditions. In the control group no significant deviation was found between the average blood sugar values at different hours. There was, however, a significant deviation between the blood sugar values of different persons. The studies with regular insulin revealed that the blood sugar reaches its lowest point after one hour and returns to its starting point in eight hours. With regard to protamine zinc insulin, the author's observations differed from those reported in the literature. He found that it was active for 18 hours, not for as long as 48 hours. The lowest blood sugar levels were reached in five to eight hours. Di-insulin acts for 16 hours. The greatest decrease in blood sugar is during the first three hours. Isoinsulin is active for 17 hours, with rapid decrease of sugar in the first hour. The steep decrease within the first hour leads to the assumption that this preparation contains regular insulin, but, according to Haalas Möller, this is not the case. The action of globin-insulin is identical with that of di-insulin. N. P. H. 50 insulin acts for 11 hours. The lowest blood sugar levels appear after three to four hours. Experiments with mixtures gave the impression that the duration of action of the mixture depends on the regular insulin content only so far as the decrease during the first three hours is greatest with the mixture containing the largest amount of regular insulin (the 3:1 mixture) and that thereafter the blood sugar takes longer to come back to the original level than with the 2:1 and the 1:1 mixtures. This would explain the longer duration of the action with a higher regular insulin content.

Deutsche medizinische Wochenschrift, Stuttgart

77:161-192 (Feb. 8) 1952. Partial Index

*Felty's Syndrome and Chronic Polyarthritis. A. Störmer.—p. 161.
*Influence of Muscular Exertion on Hypotension. A. Weiss.—p. 166.
Bacteriostatic Treatment of Acute and Chronic Infections of Biliary Tract. W. Schulz and H. Voth.—p. 170.
Contributions of Internal Medicine to Kretschmer's Theory of Constitution. D. Jahn.—p. 176.

Felty's Syndrome and Chronic Polyarthritis.—The case of a patient who had chronic polyarthritis with roentgenologic evidence of osteoarthrotic changes on all joints of the extremities, as well as hepatosplenomegaly and leukopenia, reminded Störmer of literature reports on Felty's syndrome. He discusses this syndrome and rejects the idea that it can be regarded as a separate entity. He suggests that infections and allergic processes are involved, the localization, severity, and course of which is governed by the nervous system. From this point of view, Felty's, Still's, and Sjögren's syndromes cannot be regarded as separate entities, but are all forms of chronic polyarthritis. There are transitional forms that can also be considered forms of nonspecific rheumatic polyarthritis. In all these cases the arthritis may be related to hidden foci of infection.

Influence of Muscular Exertion on Hypotension.—In earlier investigations Weiss had studied the effect of muscular exertion on hypertension, and in this paper he describes studies on patients with hypotension. Persons with normal blood pressure served as controls for both groups. It was found that after the period of recovery that followed the exertion, patients with hypotension showed an increase in blood pressure, whereas many of those with hypertension showed a decrease in blood pressure. Thus muscular exertion acts as a stimulus in hypotension and as a sedative in hypertension, that is, it acts as a counter-regulator.

Glasgow Medical Journal

33:1-32 (Jan.) 1952

*Acute Perforated Peptic Ulcer: Study of 509 Cases. A. A. [illegible] and D. J. Livingstone.—p. 1.
Weil's Disease in Glasgow Fishmarket. J. G. Goodie, I. B. L. Weir and T. S. Wilson.—p. 9.
Penicillin Treatment of Acute Haematogenous Osteitis: Review of Some Unsatisfactory Results. W. M. Dennison.—p. 15.

Acute Perforated Peptic Ulcer: Study of 509 Cases.—Experience at the Glasgow Royal Infirmary from 1935 to 1950 showed a marked decline in postoperative mortality following peptic ulcer perforation. Simple surgical closure of the perforation is the best treatment in this emergency. Advanced age and long preoperative delay increase the surgical risks, but are not contraindications to operation. Chest complications are especially frequent following perforated peptic ulcer, but their seriousness has diminished since the introduction of penicillin and the sulfonamides. Peritoneal and cardiovascular complications have declined in frequency and severity. The average hospital stay in 1935-37 was 22.8 days; in 1948-50 it was only 16.5 days, reflecting the improvement in the postoperative course. The downward trend in mortality and morbidity is attributable to the sulfonamides, penicillin, and modern anesthetic methods.

Journal of Endocrinology, London

8:1-88 (Jan.) 1952. Partial Index

Studies of Human Thyroid Function Measured by Radio-Iodine, and Its Relation to Basal Metabolic Rate. M. [illegible], C. F. [illegible], R. F. Hemphill and others.—p. 1.
Fluorimetric Determination of Oestrogens. H. [illegible].—p. [illegible]
Effect of Ephedrine on Excretion of [illegible] [illegible], 17-Ketosteroids and Uric Acid in Healthy Men. E. M. [illegible], V. H. H. [illegible] and D. R. C. Wilcox.—p. [illegible]
Some Effects of Administering "Anti-Thyrotropic" [illegible] to Rats. A. Lawson and C. E. Searle.—p. [illegible]
Adrenocorticotrophic-Like Activity in Plasma. [illegible] and D. M. V. Parrott.—p. [illegible]
Plasma and Urinary Amino-Acids in Diabetes. C. E. [illegible] and R. S. [illegible] Illing.—p. 44.
Diabetogenic Activity of [illegible] in [illegible] [illegible].—p. 51.
Studies on Antibody Formation in ACTH in [illegible] [illegible] Hardisty and J. L. [illegible].—p. 56.

Lancet, London

1:[illegible] (Feb. [illegible]) 1952

Surgical Treatment of [illegible] [illegible] W. Walters.—p. [illegible]
Results of Partial Gastrectomy for Peptic Ulcer. [illegible].—p. [illegible]
Psychology and [illegible] Ulcer. [illegible].—p. [illegible]
Role of Pituitary and Adrenal [illegible] Salicylates in Vitro. M. [illegible].—p. [illegible]
Improved Cell for [illegible] [illegible] E. G. [illegible].—p. [illegible]
*Results of Prolonged Treatment of [illegible].—p. [illegible]
*Significance of Folic [illegible] in the [illegible].—p. [illegible]
Acute Yellow Atrophy of Liver Following [illegible] Urea. L. A. [illegible] and [illegible].—p. [illegible]

Treatment of Idiopathic Steatorrhea.—[illegible] steatorrhea who had been treated for [illegible] first estimation of the fat balance were [illegible] tion. None of them had visited [illegible] endemic, and in all of them [illegible] cluded because the excretion of [illegible] mal. Every patient had had symptoms for [illegible] and one for 16 years. The treatment [illegible] tein, low fat, low starch diet, with [illegible] late, 4,000 I. U. of vitamin A [illegible] 20 mg. of folic acid daily by mouth. [illegible] ances the patients were given a test diet containing 70 gm. of protein and 70 gm. of fat daily. There was clinical improvement in every case, and fat balances revealed a significant decrease in the excretion of fat. In two cases the loss of fat in the feces fell to within normal limits. None of the patients relapsed during the period of study. The present series of cases differs from those reported by other workers in the length of observation and in the administration of folic acid throughout this period. All patients improved, and the improvement was maintained during the period of study. It is tempting to ascribe this result to the use of folic acid. The mainstay in the treatment of steatorrhea is still the provision of a suitable diet and the treatment of the deficiencies in vitamins and minerals that are likely to occur.

Significance of Pallor in the School Child.—The significance of pallor in children who are otherwise apparently well was investigated in about 1,200 Cambridge school children, aged 4 to 11 years. This survey shows that, compared with the child of normal color, the pale child is more likely to weigh less, to be of a lower state of nutrition, to have a lower Tuxford index, and possibly to be shorter and to have a weaker grip. The hemoglobin level is not related to pallor. A pale child is just as likely to have a high or low level of hemoglobin as a child who is not pale. The level of hemoglobin is not associated with most of the other factors studied, and the only association found was a lower level in children from larger families. In particular, levels as low as 75% of the normally accepted standards may apparently exist with no untoward effect. Two explanations are suggested for the observation that the hemoglobin level was apparently independent of nutritional state, physique, or performance. One is that this represents true physiological variation, and that, in many instances, neither iron nor any other substance is the limiting factor in the production of hemoglobin. The second is that the lower levels may not be maximal but are nevertheless adequate for all bodily functions. This is supported by the observations of Magee and Milligan on the hemoglobin of women before and after labor, many of whom had low levels that could be raised by administration of iron. They observed that most of the women, whether taking iron or not, were healthy and had no complaints, which raised the question whether a hemaglobin level raised by iron therapy is an advantage.

Nervenarzt, Heidelberg

23:1-40 (Jan. 20) 1952. **Partial Index**

*Multiple Sclerosis as Virus Disease. J. Hallervorden.—p. 1.
Neurosurgical Treatment of Congenital Megacolon: Its Foundations and Clinical Results. T. Hansen.—p. 9.
Clinical and Pathologic Aspects of Lesions of Peripheral Nervous System Caused by Sulfonamides. H. Glückert and W. Benoit.—p. 17.
Question of Impaired Liver Function in Endogenous Psychoses. H. J. Chemnitz.—p. 31.

Multiple Sclerosis as Virus Disease.—Although the entity of multiple sclerosis has been recognized for more than a century, its etiology is still unknown. It is designated as "sclerosis" because the fiber formation in the proliferated glia involves "hardening," although the essential characteristic of these foci is a special form of demyelinization. Hallervorden shows that there is a surprising parallelism between the so-called ring spot diseases of plants (such as tobacco mosaic virus and potato X-virus disease) and multiple sclerosis. The same forms of concentrically stratified foci, of simple continued foci, and of combinations of these are found in the ring spot diseases and in multiple sclerosis. The development of these foci can be traced to the diffusion of a steadily increasing infective agent, which in plants has been demonstrated to be a virus. The stratification of the concentric foci can probably be traced to the rhythmical formation of defense substances in the tissues. Such defense substances against virus have been demonstrated in plants. The haphazard localization of foci is the same in the plant and human diseases, but both also have certain sites of predilection. Dissemination takes place in the parenchyma as well as by way of the vascular system. There is fixation to a certain tissue substrate and thus to a certain organ. The author feels that the purely morphological similarities between the plant and human diseases, which reveal identical modes of dissemination, justify further search for a virus origin of multiple sclerosis.

Presse Médicale, Paris

60:61-80 (Jan. 19) 1952

*Pulmonary Embolism Causing Hemorrhage in 2 Cases of Phlebitis Treated with "Tromexan." L. de Gennes and Beaumont.—p. 61.
Restlessness and Nocturnal Paresthesia Agitans of Lower Extremities. M. Bonduelle.—p. 62.
Neuroendocrine System in Ancylostomiasis. J. Moreira da Fonseca. —p. 64.

Hazards of Ethyl Biscoumacetate Treatment in Phlebitis.—Two patients, a man, aged 44, with postinfluenzal phlebitis, and a woman, aged 81, with postoperative phlebitis, were treated with daily doses of 600 mg. of ethyl biscoumacetate (tromexan®). In both patients the local and general symptoms of the venous thrombosis did not respond to the treatment, despite maintenance of the prothrombin level between 15 and 20% of normal, a presumably safe and effective therapeutic range. Pulmonary embolism resulting in infarction occurred on the 8th day of the treatment in the man and on the 14th day in the woman. Within 36 and 48 hours, respectively, after the occurrence of the pulmonary embolism severe hematuria appeared, lasting three days despite discontinuation of treatment with ethyl biscoumacetate. Profuse hemoptysis occurred simultaneously, and one patient had ecchymosis at the elbow. In both patients the prothrombin level was not lower when the hemorrhages occurred than it was before the occurrence of the pulmonary embolism. One of the authors reported in a previous paper that by using the in vitro heparin tolerance test, a considerably prolonged period of hypocoagulability could be demonstrated in more than 80% of cases following formation of a thrombus in the pulmonary artery. Thus the hypocoagulability secondary to the embolism combined with that resulting from the therapeutic hypoprothrombinemia may have been responsible for the undesirable effects of the anticoagulant therapy in the two patients. Because of these spontaneous changes in the coagulability of the blood that may be observed in the course of venous thrombosis, safe control of treatment with bishydroxycoumarin derivatives cannot be obtained by determination of the prothrombin level alone. In vitro heparin tolerance tests should also be performed to evaluate the effect of hypoprothrombinemia on the coagulability of the blood and to measure the results of spontaneous and therapeutic changes in the blood. These tests will indicate whether the dosage of the drug should be increased in case of persistent hypercoagulability despite definite hypoprothrombinemia, or whether the dosage should be reduced in case of excessive hypocoagulability, even if the prothrombin level has not been lowered beyond the limits erroneously considered as safe.

Wiener medizinische Wochenschrift, Vienna

102:87-104 (Feb. 2) 1952. **Partial Index**

Transmission of Poliomyelitis in Pregnancy and Delivery. H. Braitenberg. —p. 87.
Concept of Arrest of Heart's Action in Diphtheria and Its Prevention. K. Gerhold.—p. 92.
*Roentgen Irradiation of Thyroid as Method of Treatment for Eczema. F. Hammer.—p. 98.

Roentgen Irradiation of Thyroid for Eczema.—Of 1,000 patients with chronic eczema, 900 recovered completely with local irradiation with minimum doses of soft roentgen rays, while previous treatment with ointments had failed. In the remaining 100 patients the eczema proved refractory to local irradiation treatment; these patients presented the typical symptoms of thyrotoxic disturbances, although the Merseburg triad was not always manifest. Based on the concept of hormonal influence on extremely refractory dyshidrotic eczema, 70 of the 100 patients were given irradiation therapy of the thyroid with small doses of 100 to 200 r to each of its lateral lobes, and with the following technical factors: 168 kv. 4 ma., 30 cm. focal-skin distance, 8 by 10 field size and 0.5 mm. Cu. That was followed by two or three local irradiations with 30 r. Considerable improvement and occasionally complete recovery resulted within 8 days in some patients, and within 14 to 21 days in others. Irradiation of the thyroid was repeated for a second time in 17 patients. The highly satisfactory results of the thyroid irradiation demonstrated its favorable effect on the eczema, and proved that dysfunction o the thyroid had been responsible for the refractory course o the eczema.

BOOK REVIEWS

A Textbook of Clinical Neurology with an Introduction to the History of Neurology. By Israel S. Wechsler, M.D., Clinical Professor of Neurology, Columbia University, New York. Seventh edition. Cloth. $9.50. Pp. 801, with 179 illustrations. W. B. Saunders Company, 218 W. Washington Sq., Philadelphia 5; 7 Grape St., Shaftesbury Ave., London, W.C.2, 1952.

This is one of the most popular textbooks of neurology in the English language. It has been written by one of the most outstanding neurologists and teachers of this country. In this edition the author has made a thorough revision and brought the text up-to-date. This is an excellent book for students. It is clearly written. Each subject is concisely presented. The information presented is in accord with the latest opinions and investigations in the field. The illustrations are well selected and well reproduced. There is an adequate bibliography and a good index.

As is to be expected in a textbook of this type the discussion of few subjects is exhaustive. The book is thus more suitable for student use than as a reference work. Many of the more minor subjects are dismissed with only a few words. There are few statements with which anyone familiar with the field would disagree; but there are some. It was in monkeys rather than "lower apes" that section of the pyramidal tract failed to induce a condition in which Babinski's sign could be elicited. A rise of only 35 to 50 mm. of pressure in the spinal fluid on Queckenstedt's test would be unusually low. Few persons would agree that the value of tracheotomy in suitable cases of bulbar poliomyelitis was still in doubt. Unfortunately pantopaque myelography is not always sufficient to differentiate multiple sclerosis from a lesion compressing the spinal cord. The author did not describe or illustrate the characteristic appearance of hemangioma of the vertebra in the x-ray film. The statement that operations are of little avail in chronic hypertrophic pachymeningitis of the cervical spinal cord is misleading. The author's implication that treatment is beneficial in cases of progressive muscular dystrophy is not a straightforward statement of the facts. Skew deviation of the eyes is generally believed to result from lesions in the brain stem or in the middle cerebellar peduncle rather than from true cerebellar lesions. The lower part of the lower extremity is not represented in the upper part of the precentral gyrus on the convexity of the cerebral hemisphere as is illustrated on page 300. It is not true that "operation is not indicated in metastatic abscesses" of the brain, and the author's following qualifying statement does not adequately correct the erroneous impression left by the positive statement quoted above (page 418). The treatment of intracranial aneurysms and of spontaneous subarachnoid hemorrhage is not adequately presented. There is no good evidence that the tremor of paralysis agitans has been eliminated by excision of the caudate nucleus or the removal of area 6 (of Brodmann). The Kayser-Fleischer corneal ring is not mentioned in connection with the hepatolenticular degeneration of Wilson, although it is mentioned in connection with the pseudosclerosis of Westphal.

In an unfortunately large number of instances neurological diseases are chronic diseases. In the treatment of these the attitude of the patient and the physician's approach to the patient and his problems are often of far more importance in the rehabilitation of the patient than are specific remedies. The author has neglected this phase of his subject. He has not outlined to the student what a proper psychological approach would be with the epileptic, the victim of multiple sclerosis, or the patient with peroneal muscular atrophy.

Callander's Surgical Anatomy. By Barry J. Anson, M.A., Ph.D. (Med. Sc.), Professor of Anatomy, Northwestern University Medical School, Chicago, and Walter G. Maddock, M.S., M.D., F.A.C.S., Elcock Professor of Surgery, Northwestern University Medical School. Third edition. Cloth. $14. Pp. 1074, with 929 illustrations. W. B. Saunders Company, 218 W. Washington Sq., Philadelphia 5; 7 Grape St., Shaftesbury Ave., London, W.C.2, 1952.

This most recent edition of a well-known book should be received enthusiastically by medical students as well as accomplished surgeons. The book was originally planned with the definite idea of suggesting the paths of surgical approach to the pathological process to be removed or corrected. The new coauthors have faithfully adhered to this program in the old chapters as well as in new additions. The chapter on the thoracic cavity is a new, masterly presentation of a subject that has been attracting much attention in the last decade. The chapter on the abdominal cavity has been rewritten to include portacaval anastomosis and many valuable details pertaining to gallbladder surgery, such as variations in the origin of the cystic artery.

Some old illustrations have been completely omitted or replaced by new ones from the senior author's "Atlas of Human Anatomy." The elimination of figure 316 of the first edition, which shows the deep lateral view of the thyroid region, is regrettable. Reproduction of this figure, which has a great didactic value, would advantageously supplement figure 194 in the new edition. Figure 8, showing the interior of the base of the skull, lacks the clarity of the old figure 13. The prohibitive cost of color illustrations, which enhance the value of anatomic atlases and books, is probably responsible for their omission from the new book. This is unfortunate, as it puts domestic publications at a disadvantage when they are compared with continental issues.

The pages are set in double columns to increase reading ease. This book, printed in clear type, on good paper and attractively bound, is a worthy successor to the first two editions and as such is wholeheartedly recommended to students and surgeons alike.

Symposium on Steroids in Experimental and Clinical Practice. Edited for Committee on Arrangements by Abraham White. Cloth. $7.50. Pp. 415, with 103 illustrations. Blakiston Company (division of Doubleday & Company, Inc.), 1012 Walnut St., Philadelphia 5, 1951.

This symposium was organized by S. A. Syntex of Mexico, in order to discuss the effects of the natural and synthetic 11-desoxy steroids in physiological and pathological states. Animal and human studies utilizing Δ5-pregnenolone, 21-acetoxypregnenolone, desoxycorticosterone acetate, Reichstein's compound L (3 β-acetoxy-17 α-hydroxyallopregnan-20-one), progesterone, and their various esters were reviewed by the attending investigators. It was shown that this group of steroids had many physiological effects, which could be classified as folliculoid, testoid, luteoid, corticoid, spermatogenic, renotropic, anesthetic and antifibrinomatogenic. Pregnenolone and progesterone apparently have effects on animal heart muscles similar to digitalis in respect to excitability and rhythm but opposite in effect on contractility. Certain of the 11-desoxy compounds in large doses have shown inhibitory effect on development of the chick embryo. While this was hoped to indicate antitumorogenic effect, the most potent compounds were ineffective in treating human cancer.

Controversial papers on the effects of testosterone propionate and pregnenolone in the treatment of rheumatoid arthritis were read by clinicians not experienced in the long-term treatment of this condition. Claims of benefit with these steroids were emphatically refuted by more experienced clinicians on the basis of controlled studies utilizing American Rheumatism Association criteria and grading. A most interesting review of the role of steroids in the treatment of neoplastic disease closes the book.

The reviews here published have been prepared by competent authorities and do not represent the opinions of any official bodies unless specifically stated.

Recent Advances in Bacteriology. Edited by J. H. Dible, M.B., F.R.C.P., Professor of Pathology, Postgraduate Medical School of London, University of London. Third edition by J. D. MacLennan, M.B.E., M.D., with assistance of Mary Barber, M.D. Cloth. $5. Pp. 322, with 14 illustrations. Blakiston Company (division of Doubleday & Company, Inc.), 1012 Walnut St., Philadelphia 5, 1951.

Contributions in the various fields of bacteriology in the last two decades have been so voluminous that their compression into a small book can be only a summary review. As such, the authors of this book have succeeded in presenting a very readable account.

Highlights of the progress in bacterial morphology, physiology, and nutrition are presented in the first few chapters. Also included is a simple, clear description of the fundamentals of the electron microscope. Subsequent chapters are devoted to the following bacteria of medical importance: staphylococci, streptococci, Clostridia, Corynebacteria diphtheria, enteric organisms, and anaerobes. Each of these groups is discussed briefly from the point of view of classification, toxin production, and pathogenicity.

Of particular interest is the chapter on anaerobic coccal diseases of man. The authors state that the newer chemotherapeutic agents, which have been so effective in the treatment of aerobic coccal infections, have little value in combating the anaerobic cocci. Wound and human bite infections, postoperative synergistic gangrene, chronic undermining burrowing ulcer, and the highly fatal anaerobic coccic puerperal sepsis are all diseases in which surgical intervention is still the best treatment. The importance of employing anaerobic methods in the diagnosis of infections is emphasized. The authors warn the clinician against the acceptance of reports of sterile pus, sterile blood, and sterile culture, without having ruled out the anaerobes.

A serious omission in this book is a discussion of the recent advances in tuberculosis; nor are there any chapters on the Brucella, Neisseria, spirochetes, and Rickettsia. The viruses have been purposely omitted, since the authors felt that they now belong to a special branch of biology outside the field of bacteriology. The last three chapters include extremely short discussions on the sulfonamides and antibiotics.

This brief discourse on the advancements in the field of bacteriology during the past 20 years can be found in more expanded form in any recent bacteriology textbook and is therefore recommended only as a light and entertaining review.

Cleft Lip and Palate. By W. G. Holdsworth, F.R.C.S., Surgeon, Rooksdown House, Basingstoke, Southampton, England. With foreword by Sir Harold Gillies, C. B. E., F.R.C.S. Cloth. $5.50. Pp. 126, with 87 illustrations. Grune & Stratton, Inc., 381 Fourth Ave., New York 16, 1951.

This book covers the following subjects: the lip and palate, development, clefts, cleft lip, cleft palate, secondary operations, nursing care, and anesthesia. Although it would not be unorthodox, it probably would have been better to have the section dealing with embryology precede the one dealing with anatomy. Herein is described a common deformity and some of the ways in which it can be treated. The shortcomings of the various methods of treatment are discussed, and a sincere effort is made to present the problems in their true perspectives. Showing the ectoderm in green and the endoderm in red in all of the plates is helpful, despite the diagrammatic presentation of this material. Such details as armamentarium, nursing care, and anesthesia have not been overlooked. The material is presented in clear and concise style. This book can be recommended to anyone interested in the cleft lip and palate.

Traité de thérapeutique chirurgicale. Tomes I et II. Par P. Bertrand et J. Creyssel, professeur agrégé à la Faculté de médecine, Lyon. Cloth. 23000 francs per set. Pp. 1843; 1947-3369. Gaston Doin & Cie, 8 place de l'Odéon, Paris, 6^{e}, 1951; 1952.

This encyclopedic work in two volumes consists of 3,369 pages written by two widely experienced surgeons. It is devoted to the subject of surgical therapy, without description of the technique. In view of the fact that comprehension of therapeutic measures is based on familiarity with the anatomy, pathogenesis, etiology, and clinical picture of the condition, all these factors have received consideration in the discussion of each surgical lesion.

The first chapter, which deals with anesthesia, also gives a birdseye view of the therapy used for postoperative conditions. In the second chapter, therapeutic adjuvants of surgical procedures, such an anti-infectious treatment and blood transfusions, are described. The following chapters are devoted to an outline of the treatment of diseases of various tissues, such as skin, muscles, tendons, blood vessels, or bones. Finally, therapy of lesions of the extremities, the spine, and the chest is described without detail. The scope of the work is immense, in addition to general surgery in the strict sense of the word, it encompasses selected problems in gynecology, urology, orthopedics, and neurosurgery. The authors have selected from these fields, in an arbitrary fashion, conditions that come within the scope of the general surgeon.

The deliberate elimination of photographs greatly detracts from the didactic value of the book, because, not infrequently, a good illustration is more instructive than a lengthy explanation. Omission of a bibliography also limits the value of this type of a reference book considerably. A cursory perusal of the text failed to locate discussion of such important subjects as hypokalemia, tests employed in the study of varicose veins, or the use of nitrogen mustard in treating malignant growths. The most disconcerting feature of this book is the nebulous verbosity and innumerable repetitions attributable to the singular arrangement of the text. Although the two volumes contain a wealth of up-to-date information, the material pertaining to the same subject is scattered throughout various chapters. The print is large and easily read, the paper of excellent quality, and the binding attractive. There is a good index. Streamlining and condensing this work into a book of lesser size would automatically eliminate much of the adverse criticism.

The Better Half of Your Life: How to Live in Health and Happiness from Forty to Ninety. By Charles H. Lerrigo, M.D. Cloth. $3.50. Pp. 270. John Day Company, Inc., 210 Madison Ave., New York, 1951.

In a simple, understandable, common sense way, Dr. Lerrigo tells the reader how to add more years to his life as well as how to add more life to his years. He discusses, in some detail yet at the same time in a simple way, most of the technical problems associated with aging. Throughout his discussion, he has liberally sprinkled the sharp wit that characterizes his conversation, so that the book becomes easy and interesting reading. Not only could this be read by nonmedical persons who are past 40, because they are interested in the years past 40, but it could be read by physicians of any age to give them insight into some of their own problems as well as the problems of their senior patients. Dr. Lerrigo spends considerable time on emotional health, on the adjustment to the normal infirmities of aging, on personal attractiveness, on hobbies, and on the problem of where and how older persons will live. His whole story is woven around the general theme expressed by Browning in "Rabbi Ben Ezra." "Grow old along with me, the best is yet to be. The last of life for which the first was made."

The Photography of Patients Including Discussions of Basic Photographic and Optical Principles. By H. Lou Gibson, F.B.P.A., A.P.S.A. Publication number 95, American Lecture Series, monograph in American Lectures in Medical Photography, edited by Ralph P. Creer, Secretary, Committee on Medical Motion Pictures, American Medical Association, Chicago. Cloth. $5.50. Pp. 118, with illustrations. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill.; Blackwell Scientific Publications, Ltd., 49 Broad St., Oxford, England; Ryerson Press, 299 Queen St., W., Toronto 2B, 1952.

The use of photography in medicine has grown in importance through the years to the point where it is now almost indispensable as an aid in teaching, in the dissemination of knowledge, and in scientific investigation. The photography of patients represents a large portion of the various services offered by a clinical photography department, and an authoritative book on the subject is most useful. The author of this book has organized his text, so that it will be helpful to the "snapshooter" as well as the experienced medical photographer. The opening chapter on fundamentals briefly discusses the purpose of the picture to be taken and the importance of preplanning. Later, the selection of equipment, which includes cameras, lights, exposure meters, proper background, and darkroom items is discussed. Those who wish to take close-up pictures with the amateur roll film camera will find practical suggestions, including a table of lighting and exposure data. The well-illustrated section on the basic principles of lens properties is presented in simple concise terms. The selection of film and proper filters for the recording of various types of medical subjects is discussed. Several pages are devoted to the use of color films, and there is a series of simple tables giving exposure data. There have been many poor prints made from good negatives; thus, this monograph appropriately ends with several helpful suggestions regarding printing methods and print quality. A good many excellent illustrations (four in color) are used to document this text. The book is completely indexed, but only a few references to the literature are cited. Physicians who make photographic records in connection with their office practice will find much practical and useful information in this book. It is recommended to the average clinical photographer in hospitals and medical schools, and it should be on the shelf of medical school libraries. It is not designed as a postgraduate course for the expert.

Individual Differences in Colour Vision. By R. W. Pickford, M.A., Ph.D., D.Litt. Cloth. $5. Pp. 386, with illustrations. The Macmillan Company, 60 Fifth Ave., New York 11; J. W. Arrowsmith, Ltd., 12 Small St., Bristol 1, 1951.

The author summarizes a vast amount of experimental work on the baffling problem of color vision and discusses some excellent new technics. His primary concern is the theoretical explanation of color vision, and his conclusion on this point (page 367) is that a "four-receptor theory, with a separate response-system for brightness, fits the facts with astonishing ease and adequacy, and requires no special pleading to support its claims."

There is also a thorough consideration of genetic theories, from which it becomes clear that the simple statements made on the subject in the past are misleading. The difficulties involved in the study of human inheritance are great in regard to color vision, and the solution of this problem depends not only on the study of many persons and the application of intricate statistical procedures but also on the development of tests that do not predetermine the results. In view of the intricacies of these tests, one cannot too strongly condemn the current misuse of the colored guidelines on Snellen charts for testing applicants for automobile drivers' licenses.

Although the detection, analysis, and explanation of anomalies of color vision have attracted many investigators, some progress is also being made with the study of the ways in which people with these anomalies compensate for their handicaps. The inconsiderate and unsympathetic attitudes frequently manifested by the normal toward the handicapped are exemplified in some of the interesting cases cited by the author (pages 22 to 25 and 229 to 234). Future work should emphasize the positive aspects of the problem such as the search for optimum design and color for road signs (page 35). In addition to being a fundamental contribution, this book is to be commended for its readable style, good index, valuable bibliography, and neat format. It is particularly recommended to physiologists, ophthalmologists, and psychologists.

The Dynamics of Psychological Testing: A Formulation and Guide to Independent Clinical Practice. By Milton S. Gurvitz, Ph.D., Chief Psychologist, Hillside Hospital, Bellerose, N. Y. Cloth. $6.75. Pp. 368, with 26 illustrations. Grune & Stratton, Inc., 381 Fourth Ave., New York 16, 1951.

This book describes the methods of application and interpretation of projective testing used in diagnostic clinical psychology. The author attempts to show, through a series of detailed reports on the projective testing of patients, how the psychologist may often closely approximate the diagnosis and description of a patient given by the psychotherapist only after a long period of detailed interview. The book is divided into four parts: a discussion of general problems that the psychologist encounters in the psychological testing of patients, detailed description of the mechanics of testing and the formulations derived from such tests as the Wechsler-Bellevue and Rorschach, results of the psychological tests of seventeen patients and a comparison of the test results with the general impressions of the attending psychiatrist, and an evaluation and synthesis of the methods used in arriving at diagnoses. Twenty-six figure drawings illustrate the author's method of arriving at concepts of underlying patient attitudes by interpretation of the drawings and of the patients associations to the completed picture.

Verhandlungen der Deutschen Gesellschaft für Kreislaufforschung: 17. Tagung zu Bad Nauheim vom 30. März bis 1. April 1951. Hauptthema: Lungenkreislauf. Herausgegeben von Prof. Dr. Hans Schaefer. Paper. 30 marks. Pp. 322, with illustrations. Dietrich Steinkopff Verlag, Holzhof-Allee 25, (16) Darmstadt, 1951.

This volume, written in German, is essentially the report of the 17th meeting, in 1951, of the German Society for the Study of the Circulation and contains the list of previous meetings, the membership, the business report, the chairman's address, 54 reports by authors primarily concerned with the pulmonary circulation, literature references, and pertinent discussions. The book is highly specialized, but it would prove interesting to those interested in pulmonary circulation who are able to read German fluently. There is a great deal of information. Much of the book is in small type, but it is clearly presented and in good form. The book covers 21 years of heart catheterization and prospects for the future, physiology of the pulmonary circulation, functional anatomy of the pulmonary vessels, pathological anatomy of the pulmonary circulation, hemodynamics of pulmonary circulation disturbances, pulmonary circulation and pulmonary function, significance of oxygen pressure, reflexes of the lesser circulation, cor pulmonale and the pulmonary circulation in silicosis, roentgenology of the pulmonary circulation, pulmonary circulation before and after operations for mitral stenosis, electrocardiogram examinations of the lesser circulation, a new classification of hypertension forms, pharmacology of ganglion blocking substances, alveolar aeration in asthma and emphysema, inheritance of hereditary heart failure, circulatory disturbances in osteitis deformans, a new oximeter, indications for aortography, and demonstration of disease of the pulmonary circulation.

The volume covers a wide latitude of subjects on the pulmonary circulation as far as the scientific aspects and views are concerned and, therefore, can be recommended to those who seek to delve into or browse in this intricate phase of human disease and function.

Liver Injury: Transactions of the Ninth Conference April 27 and 28, 1950, New York, New York. Edited by F. W. Hoffbauer, M.D. Cloth. $3. Pp. 232, with illustrations. Josiah Macy, Jr., Foundation, 565 Park Ave., New York 21, 1951.

In this book, the following topics are discussed: (*a*) correlation of hepatic function and structure based on liver biopsy studies, (*b*) needle biopsy of the liver, clinical applications, (*c*) clinical aspects of hepatic vascular physiology, (*d*) studies of hepatic lymphatics, (*e*) the escape of lipid from fatty cysts in experimental dietary cirrhosis, (*f*) kwashiorkor, and (*g*) vitamin B_{12}, folic acid, and the lipotropic agents. Drs. Hans Popper, Leon Schiff, Stanley E. Bradley, Jesse L. Bollman, W. Stanley Hartroft, J. N. P. Davies and Paul Gyorgy are the discussants. Each topic is followed by a record of the discussion of the conference guests. Subject matter and discussions are informally presented on a high scientific plane and in an interesting and readable style. The information represents recent personal investigations of the contributors and will be valuable to physicians interested in liver disease.

Medical Milestones. By Henry J. L. Marriott, M.D. Foreword by Sir Alexander Fleming. Cloth. $3.50. Pp. 293, with 6 illustrations. Williams & Wilkins Company, Mount Royal and Guilford Aves., Baltimore 2, 1952.

This book, written for the layman, reviews a number of recent medical and surgical advances, including antibiotics, heart surgery, antithyroid drugs, and cortisone, corticotropin (ACTH), and DDT. Though the style is distinctly colloquial, the material is for the most part covered in an accurate and conservative manner. The final chapter, designed to encourage the layman to view progress with a due sense of proportion, detracts from the tenor of the book. Readers may well wonder at the author's classification of "canning, freezing, pulverizing, pasteurizing and over-cooking" as "the destructive processes of our civilization" and question his opinion that artificial fertilizers are "the agents which are perhaps undermining our health more than any other factor today."

QUERIES AND MINOR NOTES

ISOLATION AND QUARANTINE REGULATIONS

To the Editor:—*This town is considering a revision of the regulations concerning isolation and quarantine for communicable diseases. I would appreciate the recommendations of an authority on the subject to present to the board of health.*

Richard J. Rushmore, M.D., Florham Park, N. J.

Answer.—The following information was provided by the health department of one of our largest cities. Because of lack of space only general suggestions can be incorporated in this reply. For more specific and detailed information, it would be advisable for the inquirer to contact his state health department in order to coordinate state rules and regulations with those of the local community. In addition, it is suggested that he contact the U. S. Public Health Service, Washington, D. C., and the American Public Health Association, 1790 Broadway, New York 17, to obtain additional suggestions. The regulations for isolation and quarantine vary in different states and communities.

Suggestions for the establishment of the regulations concerning isolation and quarantine for communicable diseases follow. General procedures should be outlined for the control of communicable diseases and should define the establishment, duration, and termination of isolation and quarantine. Detailed procedures for the control of communicable diseases should include measures necessary for the control of patients, contacts, carriers, and sale of food and milk where this applies and general measures necessary to prevent the onset and spread of communicable diseases.

Some of the more important communicable diseases are amebiasis, chickenpox, diphtheria, rubella, measles, mumps, poliomyelitis, scarlet fever, smallpox, and whooping cough. In amebiasis, isolation is not required, but the patient or carrier must submit specimens of feces until three consecutive specimens taken not less than one week apart are negative for trophozoites or cysts of Endamoeba histolytica. Food handling by the patient or a carrier is prohibited until the above requirements have been fulfilled. Chickenpox patients are isolated for not less than 14 days and thereafter until all crusts have disappeared from the skin. No restrictions of contacts are required. In rubella, isolation of the patient is required from the onset of catarrhal symptoms until seven days after the appearance of the rash. No restrictions of contacts are required. Great care should be exercised to prevent the exposure of susceptible pregnant women to rubella. Measles patients are isolated from the onset of catarrhal symptoms until five days after the appearance of the rash and thereafter until the catarrhal symptoms and the abnormal secretions of the mucous membranes have ceased. Susceptible children living on the premises with the patient should be isolated for 14 days from the date of first exposure. In addition, all children under 3 years of age who have been exposed to measles should be treated with immune globulin in a dosage sufficient to prevent or modify the disease. Mumps patients are isolated until the swelling of the glands has disappeared. There are no restrictions on contacts. Acute anterior poliomyelitis patients are isolated for one week from the date of onset and thereafter until the temperature is normal for 24 hours. Children having had direct contact with a patient should be kept under medical surveillance for two weeks from the date of last exposure. Voluntary limitation of physical activity of such children is recommended. General measures should include a warning to physicians and the laity of the prevalence of the disease, a description of the usual characteristics of the onset of the illness, and the necessity for early diagnosis and medical care. Nose, throat, and dental operations, unless required as an emergency, should not be done in the presence of an increased incidence of the disease in a given community.

Patients with scarlet fever and other hemolytic streptococcic infections of the upper respiratory tract are quarantined for a minimum period of 14 days after the onset and thereafter until the nose, throat, glands, and ears are normal on inspection or until the physician reports complete clinical recovery. Patients with whooping cough are quarantined until three weeks after the appearance of the paroxysmal cough. Susceptible child contacts living on the placarded premises should be quarantined until termination of the isolation period of the patient. Diphtheria patients or carriers are quarantinued for at least seven days after the onset of the illness or the diagnosis of the carrier state and thereafter until two successive cultures from both the nose and the throat taken not less than 24 hours apart are negative for diphtheria bacilli, or when the virulence test proves the bacilli to be avirulent. General measures should include active inoculations of all children, especially those under 1 year of age, and frequent booster doses to maintain adequate immunity. Patients with smallpox are quarantined for a minimum of 21 days and thereafter until all lesions have healed and the scabs have fallen off. General measures should include general vaccination in early infancy, revaccination of children on entering school, and vaccination of the entire population when the disease appears in a community. The use of multiple pressure vaccination is recommended.

DESTRUCTION OF FUNGI IN SHOES

To the Editor:—*What substances can be put inside shoes or boots to prevent reinfection with epidermophytosis?*

F. J. Vurpillat, M.D., South Bend, Ind.

Answer.—Until recent times, shoes were sterilized by placing them in a box with a small, open dish filled with 10% "formalin." The box was sealed and the shoes exposed to the vapor for at least six hours. This procedure, however, sometimes damaged the leather; therefore, some persons have attempted to kill the fungi inside the shoes by exposing them to sunshine for a few hours. The efficacy of this procedure is not proved. Recently, "carboxide gas" (containing 90% carbon dioxide and 10% ethyleneoxide) was used successfully for sterilizing shoes (Fulton, J. D.; Mitchell, R. B., and Morhouse, C. H.: Sterilization of Footwear to Prevent Reinfection with Tinea Pedis [Athlete's Foot], U. S. A. F. School of Aviation Medicine, Randolph Field, Texas, November, 1950). The "carboxide" sterilization is best done in an autoclave. The autoclave is evacuated to two-thirds of atmospheric pressure and "carboxide gas" is admitted up to 20 lb. of positive pressure. Hot steam is allowed to circulate in the jacket, so that the internal temperature is around 50 C (technique of B. Church and C. G. Loosli, to be published). Under these conditions, all species of pathogenic dermatophytes are killed after an exposure of 8 to 10 hours, and the shoe leather is not damaged.

Fungistatic dusting powders, such as 1 to 2% sulfur in equal parts of zinc oxide and talc or one of the more modern and nonirritating preparations, such as desenex® powder or asterol® powder, if dusted liberally into the socks and shoes, will inhibit the growth of dermatophytes but will not kill them. These preparations are satisfactory in preventing and controlling the clinical disease. A number of experts in this field do not believe that reinfection from shoes plays any role in flare-ups of dermatophytosis of the feet. The dermatophytes may be dormant in the nails or in the horny layer of the epidermis and may cause clinical disease at any time when local factors (mainly, moist heat [sweating] and maceration of the horny layer) become favorable for their growth.

The answers here published have been prepared by competent authorities. They do not, however, represent the opinions of any official bodies unless specifically stated in the reply. Anonymous communications and queries on postal cards cannot be answered. Every letter must contain the writer's name and address, but these will be omitted on request.

TYPHOID IMMUNIZATION AND AGGLUTINATION TESTS

To the Editor:—*A 10-year-old child became ill with a temperature of 103 F, which continued with chloramphenicol (chloromycetin®) therapy (1 gm. daily) for 11 days and ended by crisis. He had pain in his left hip, which was relieved by penicillin therapy. A roentgenogram of his hip on the fourth day of his illness was normal. At the same time, his chest showed a pneumonic process in the right base, which disappeared three days later. He had no gastrointestinal symptoms or splenomegaly. His white blood cell count, determined on several occasions, was 6,000, with 75% polymorphonuclear leukocytes and 25% lymphocytes. He had a negative reaction to an intradermal tuberculin test (1:1,000 dilution). His reactions to all agglutination tests were negative, except for those with paratyphoid A and B (O agglutinins) in dilutions of 1:640; these two tests were repeated two days later, and his reaction was still positive. After his temperature dropped, the hip pain continued, and roentgenograms revealed degenerative changes. Additional pencillin was given. His agglutination titer dropped in one month to 1:160 against paratyphoid A and B (O agglutinins). This child has received yearly doses of triple typhoid vaccine, and he received the last dose three months prior to the onset of this illness. Can an absolute diagnosis be made solely on the agglutination tests? Would not the titer rise rather than fall if a paratyphoid infection existed? What influence does triple typhoid immunization have on the agglutination tests?* *M.D., Kentucky.*

Answer.—In the case cited, an absolute diagnosis could not be made on the basis of an agglutination test. Following administration of triple typhoid vaccine, agglutinins may appear in one week, reach their peak in three weeks, and then gradually diminish. If there had been a paratyphoid infection, the titer would have been expected to rise instead of decline. Triple typhoid immunizations should promote positive reactions to agglutination tests; however, after one year, an agglutination test may be negative, and yet there may be sufficient antibodies in the blood to insure a fair degree of immunity.

RESTLESS LEG SYNDROME

To the Editor:—*I have often been consulted, especially by women, about restless legs or "Jimmy legs." Please give information as to treatment.*

W. M. McRae, M.D., Little Rock, Ark.

Answer.—The restless leg syndrome is frequently encountered in the practice of neuropsychiatry. It is characterized by an indescribable, unpleasant sensation occurring in the lower extremities. The sensation is not that of numbness, tingling, or prickling (true paresthesia). It appears at rest, most often when the patient tries to go to sleep, but at times while he or she is sitting. It is relieved by movement, and it varies in intensity. Examination of the nervous and vascular systems discloses no abnormalities that can be considered causative, even though the symptom may have been present for years.

Some authorities think of this complaint as a compulsive symptom that occurs often. Others, notably K. A. Ekbom of Stockholm, attribute the stature of a syndrome to the symptom. Ekbom stated that, in many cases, the condition is relieved by priscoline® (2-benzyl-2 imidazoline hydrochloride), carbaminoylcholine chloride (carbachol®), or glyceryl trinitrate (nitroglycerin). The complaint is relatively stubborn, but one that can, at times, be relieved by sedatives. One patient obtained relief by wrapping the legs with an elastic bandage. Treatment formulated according to the needs of the patient as a whole seems most likely to succeed.

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CLASSROOM ILLUMINATION

To the Editor:—*I have been asked about the minimum and optimum amount of light for school classrooms, as expressed in candle-foot power. How much light must be supplied to eliminate eyestrain for the student?* *M.D., Connecticut.*

Answer.—The question of correct lighting for schoolrooms is controversial; however, there is growing agreement on limits of from 20 to 40 foot candles. It is recommended that classroom lighting be checked with a foot-candle meter and any situation above or below these standards corrected. Obviously, the higher intensities would be most desirable for certain visual tasks such as typing in commercial courses, sewing in home economics, and mechanical drawing in industrial arts. On the other hand, the lower intensities would serve satisfactorily in places like gymnasiums and halls. Reasonable uniformity in lighting in all parts of the room and for all pupils should be the goal. Equal attention should be given to the elimination of glare resulting from unshielded lights and rays of the sun and of glare caused by reflections from glossy surfaces. Children should be protected from excessive differences in light-reflection factors in the schoolroom by reducing strong contrasts in color of desk surfaces, floors, woodwork, and walls. These aspects of the problem, glare and contrast, have lately been considered as important or even more so than the intensity of the illumination.

URTICARIA

To the Editor:—*A man, 52 years old, who is obese, feels that there is something wrong with him. I have consulted several physicians, and none of them can determine what it is. The patient has multiple lipoma nodules all over his body; some come and go, but others are permanent. Patches of urticaria nodules develop at various times of the day, and his upper lip gets swollen at times. This swelling occurs suddenly, lasts for two to six hours, and then quickly disappears. He also has psoriatic lesions between the fingers that sometimes cause itching. His bowel movements are regular, his urine is negative to all tests, and, except for the above symptoms, he feels well.*

Epinephrine (adrenalin®) and other medications have been tried, without permanent results. Roentgen therapy, diets, saline laxatives, and baths, hot or cold, have not corrected this condition. Can you offer any suggestions concerning this case? *Alfred J. C. Schwartz, M.D., Washington, Mo.*

This inquiry was referred to two consultants, whose respective replies follow.—Ed.

Answer.—This man apparently has chronic urticaria with lesions of angioneurotic edema. Lipomas are not expected to come and go, and the absence of fever and depressed scars eliminates the possibility of nodular nonsuppurative panniculitis. It also is likely that the itching lesions limited to the areas between the fingers are not psoriasis. Perhaps they are infectious lesions such as those caused by moniliasis. The source of his trouble, however, should be sought in hypersensitivity to either drugs, infections or foods, in a psychogenic cause, or in some unusual source, such as a physical factor, parasite, or inhalant. During the search for the source of the trouble, treatment should consist of administration of antihistaminic agents, colloid baths, and the application of soothing lotions.

Answer.—The presence of urticaria and angioneurotic edema cannot be debated. It is not so certain, from the description, that the nodules thought to be lipomas are actually composed of fatty tissue. The shifting pattern of these nodules suggests that they may also be of an urticarial nature. There is a type of urticaria in which the lesions are indurated and persist for long periods in the same sites. It may be justifiable, in this case, to section one of the nodules and to study its histological structure.

Basically, the urticarial aspect of this case resolves itself into two aspects, the etiology and the treatment. Urticaria and angioneurotic edema may be classified etiologically into two groups, allergic and nonallergic. For the allergic group, drug allergy ranks high in importance. Does the patient use antibiotics (even nose drops), aspirin, or other analgesic drugs, barbiturates, phenolphthalein, or other drugs? Foods can also cause urticarial lesions. Neither foods nor drugs are likely to give positive skin tests in such cases; hence, a diagnosis must be made or eliminated by history, observation, drastically restricted diets, and ingestion trials. Infected tonsils, teeth, or gallbladder may constitute a basis for the urticaria. Emotional and other nervous factors should not be disregarded; however, it must be admitted that the causes of a large percentage of cases of urticaria and angioneurotic edema still remain unsolved.

The most effective and simplest palliative therapy has been the use of antihistamines. Some patients require two or three times the usual recommended doses. The addition of ephedrine to the antihistamine may help. The occurrence of the lip lesion might be averted by avoidance of smoking or other possible local traumatic stimuli. Some physicians have found that histamine injections, beginning with small doses and frequently repeated, have been helpful. Various forms of nonspecific therapy have been tried. Corticotropin (ACTH) or cortisone would be worthy of trial if the condition fails to respond to other measures.

MANGE

To the Editor:—*There has been much discussion by our staff regarding mange. Please discuss etiology and transmittal from dogs to humans and proper treatment, especially roentgen therapy.*

J. E. Miller, M.D., Yonkers, N. Y.

Answer.—Mange is a cutaneous affection of dogs and other animals caused by arthropod parasites. These invertebrates have jointed legs and burrow into the deep layers of the skin, where they are thought to feed on lymph and young epidermal cells. Regarding transmissibility of these parasites, mites belonging to the same genus are usually parasitic on a number of mammals, including man. The varieties are usually specific to their host.

In the case of the dog, there are three kinds of mange mites: Sarcoptes scabiei, Atodectes cynotis, and Demodex canis. Successful treatment of mange is not easy and depends on combining active drugs with a suitable vehicle that will penetrate to the deep layers of the skin where the mites live. Drugs, such as the sulfur compounds, rotenone (a poisonous compound, $C_{23}H_{22}O_6$, from derris root and other roots), benzyl benzoate, and chlordane are useful. No references to beneficial effects of roentgen therapy were found.

LIVING WITH CATS

To the Editor:—*A woman, 55, has a fondness for cats, with which she shares her room and bed. Her window is always left open so the cats may go and come at will. The room is shockingly ill cared for, with dirt brought in by the cats' feet on the floor and bed. The cats' dishes are the same as those used by the family. For excreta there is a box of earth, changed daily, for young kittens. Is there any risk in living in such amazing intimacy with cats?*

M.D., California.

Answer.—Such intimacy with pet animals is not uncommon and, apart from the aesthetic or sanitary standpoint, should not be viewed with alarm. There is, of course, always a possibility of mechanical transfer of germs and parasites picked up by the cats while roaming, but the consensus is that the risk is small. Any corrective effort on the part of the physician or public health workers is likely to end in failure, unless it can be established that the situation creates a health hazard to neighbors. The cats may be suspected if a case of hookworm develops in this family. Also, the danger of rabies transmission should not be overlooked, notwithstanding that this disease occurs much less frequently in cats than in dogs.

IODINE DERMATITIS

To the Editor:—*A patient has had dermatitis of the face from ingestion of iodides for the past year. What type of therapy might hasten healing of the skin lesions?*

John Tocco, M.D., Endicott, N. Y.

Answer.—It might be helpful to administer sodium chloride either intravenously or orally by means of tablets or plain salt in water. In addition, the patient should avoid eating sea foods and using iodized salt, either in cooking or as table salt. The ingestion of bromides also should be avoided.

VACCINES FOR FURUNCULOSIS

To the Editor:—*What is the present status of vaccine and toxoid therapy for chronic or recurrent furunculosis due to staphylococci? Are toxoids more effective than vaccines? Are stock vaccines comparable in effectiveness to autogenous vaccines?*

M.D., Texas.

Answer.—There is a wide difference of opinion about the value of vaccines for the treatment of recurrent furunculosis. They are being employed much less frequently since the introduction of the antibiotic drugs. Some physicians still employ them for patients who do not tolerate antibiotic drugs or respond to treatment with them, and, though they consider toxoids less likely to induce untoward reactions, they deem the autogenous vaccines to be more effective than stock preparations. Such vaccines should be prepared properly to assure a minimum of destruction of antigenicity, and they are best administered intradermally.

PSEUDOHYPERTROPHIC MUSCULAR DYSTROPHY

To the Editor:—*In* The Journal (146:768 [June 23] 1951) *under Queries and Minor Notes is a question about pseudohypertrophic muscular dystrophy. While it is true that the cause of muscular dystrophy is unknown and no specific treatment for the disease has proved of value, definite benefit can be achieved through neuromuscular rehabilitation. In addition to the decline in function that occurs from the muscular degeneration in the dystrophic process, there is undoubtedly additional loss of muscle power, endurance, and skill, and further muscular atrophy from enforced inactivity and disuse. An intensive neuromuscular reeducation program overcomes the effects of disuse and results in significant decrease in disability, in spite of the steadily progressive character of the disease.*

Since 1948, we have worked with 44 patients with progressive muscular dystrophy and have brought about significant improvement in most of these patients. In almost all of these cases the progress of the dystrophic process was so slow that although the disease process undoubtedly continued, the patients' ability to do things improved significantly. Other principles of rehabilitation that have been of value in the treatment of patients with progressive muscular dystrophy include self-care training, gait training, training of skills and occupational therapy, use of braces and assistive devices, and, in some cases, orthopedic surgery. Improvement in morale, psychological outlook, social adjustment, and vocational training and placement have been important in the rehabilitation process.

Herman Kabat, M.D.
Kabat-Kaiser Institute
2600 Alameda St., Vallejo, Calif.

SEQUELAE OF HYDROCYANIC ACID POISONING

To the Editor:—The Journal, *Feb. 16, 1952, page 589, stated in a reply to a query regarding "Sequelae of Hydrocyanic Acid Poisoning" that this poison can be chronically toxic and may cause neurological symptoms after a single subfatal exposure.*

It is generally accepted that chronic poisoning refers to the toxic effects of continued exposure to concentrations that do not cause acute toxic symptoms. The opinion of toxicologists on the existence of such chronic cyanide poisoning in humans is at variance, but even those who believe in its existence agree that its symptoms are not permanent after discontinuation of the exposure.

There is no doubt that acute hydrocyanic acid poisoning leading to prolonged unconsciousness (anoxia of the central nervous system) may leave more or less permanent injury, especially of the central nervous system. These, however, are chronic injuries and should not be called "chronically toxic." I am afraid that statements such as this one are open to misinterpretation.

I may perhaps also point out that the reference to Sollmann is not correct. It should refer to page 713 and not to page 203.

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ORAL USE OF CORTISONE IN CHR INSUFFICIENC

STUDY OF SIX CASES

Marvin S. Levy, M.D., Beverly Hills, Calif.

The recent availability of cortisone has made possible great improvement in the treatment of chronic adrenal cortical insufficiency. The effect of its parenteral administration in patients with Addison's disease has been well documented,[1] but there is less information on the adequacy of oral therapy. Further data on the latter method of treatment are desirable in regard to both clinical and metabolic responses. Oral therapy, if proved effective, would permit the patient to adjust his dose easily, in accordance with the severity of symptoms, and, at the same time, would obviate the inconvenience of injections.

The six patients whose case histories provide the material for this report were studied with special reference to their responses to oral administration of cortisone. Four patients had uncomplicated Addison's disease; one had Addison's disease and diabetes mellitus; and another had symptoms of hypoadrenocorticism, secondary to removal of a chromophobe adenoma of the pituitary. The first four patients were followed in the metabolic wards of the hospital, and the other two were from private practice.

Gains in strength and weight and a sense of well-being were considered the most important evidence of a favorable clinical response. Metabolic observations included (1) alteration in carbohydrate metabolism, as shown by changes in glucose tolerance curves,[2] (2) changes in the urinary excretion of 17-ketosteroids (modification of Pincus' method[3]) and 11-oxysteroid serum electrolytes, and (4) changes in gestion of water, as demonstrated by Rob Kepler water test.[5]

Treatment with desoxycorticosterone acetate, previous to this study, was continued in all cases the patient with diabetes mellitus and Addison's disease, and for the patient with secondary adrenal cortical insufficiency, oral use of cortisone was substituted for daily injections of 0.5 to 1 cc. of lipo-adrenal cortex.

REPORT OF CASES

CASE 1.—A. B., a 29-year-old white man, was well until June, 1945, when, while serving in the European theater of war, he experienced progressive weakness, weight loss, and hypotension. A diagnosis of Addison's disease was made. Treatment consisted of desoxycorticosterone acetate implants, 500 to 850 mg. at 15 to 18 month intervals. After onset of the disease, progressive pigmentation of the skin and occasional spells of weakness and dizziness occurred. When the implants were exhausted, the patient became anorexic, weak, and drowsy and had an elevated serum potassium level, depressed serum sodium and chloride levels, hypotension, and hypoglycemia. He responded well to implantation of desoxycorticosterone acetate and was able to work as an accountant for three to four hours daily without excessive fatigue.

Examination in February, 1951, revealed an alert, well-nourished, well-developed man with deeply pigmented skin. Brownish pigmentation was present on mucous membranes, in skin creases, at points of contact, and in scars at the site of desoxycorticosterone implants. The skin of his extremities was cold and clammy. Blood pressure was 100/60. Body and axillary hair was

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From the Metabolic Section, Medical Service, Wadsworth Hospital, Veterans Administration Center, and the Department of Medicine, University of California at Los Angeles.

Reviewed by the Veterans Administration and published with the approval of the Chief Medical Director. The statements and conclusions of the author are the result of his own study and do not necessarily reflect the opinion or policy of the Veterans Administration.

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insulin was required to control the diabetes mellitus; this was little less than that required before the onset of Addison's disease. The *normal* urinary oxysteroid excretion and relatively high in-
ulin requirement cast some doubt on the diagnosis of Addison's
ase; however, by December, 1949, the patient was required
e 1 to 2 cc. of lipo-adrenal cortex daily, in order to avoid
emia. This enabled him to continue his accustomed dose
At this time, he was also taking 30 mg. of methyl-
daily. In October, 1950, the patient had a severe
, followed by an Addisonian crisis in which his
uirement dropped to 2 to 4 units of regular
unts of aqueous adrenal cortex and lipo-
ecessary at this time. In December, 1950,
vell-developed, markedly asthenic, pale,
rson. Pigmentation of the lips and
ounced, as was asthenia. Blood pres-
air, other than pubic, was absent,
results of examination were
tment with 25 mg. of corti-
51, oral cortisone therapy,
ent stated he felt better
atment. The insulin
poglycemia disap-
roved markedly,
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increase his
well con-
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sparse, but pubic hair was of normal amount and distribution. The gonads were normal. Except for pigmentation of the skin, results of examination were normal.

In March, 1951, oral treatment with 12.5 mg. of cortisone twice daily was started. There was no demonstrable effect for five days; then, the patient began to notice a state of increasing well-being and strength. After one week, he preferred to remain active all day and stated that he could not recall when he had felt so strong. Oral cortisone therapy was continued, with a single daily dose of 25 mg., with maintenance of improvement. In May, 1951, he was able to obtain and hold a position requiring eight hours' accounting work daily, although 16 months had elapsed since his last implant of six 125 mg. pellets of desoxycorticosterone acetate.

The following laboratory results were obtained immediately preceding cortisone therapy. A chest roentgenogram for tuberculosis was normal, as was a roentgenogram of the adrenal areas for calcification. The glucose tolerance curve, after ingestion of 100 gm. of glucose, was: fasting, 70 mg. per 100 cc.; after one-half hour, 170 mg.; after one hour, 122 mg.; after two hours, 78 mg.; and, after three hours, 66 mg. per 100 cc. Serum sodium was 139 mEq per liter; carbon dioxide was 26 mEq per liter; the blood urea nitrogen level was 14 mg. per 100 cc.; urinary 17-ketosteroids were 5.1 mg. in 24 hours. In the water test, the night volume of urine was 300 cc., and the largest single day volume was 90 cc.; the urea chloride index was 20.

The following laboratory results were obtained after two months of cortisone therapy, 25 mg. once daily. The glucose tolerance curve after ingestion of 100 gm. of glucose was: fasting, 70 mg. per 100 cc.; after one-half hour, 82 mg.; after one hour, 66 mg.; after two hours, 66 mg. per 100 cc.; and, after three hours, 30 mg. per 100 cc. The urinary 17-ketosteroids were 2.6 mg. in 24 hours; 11-oxysteroids were 1.97 mg. in 24 hours; blood chemistry determinations remained essentially normal. In the water test, the night volume of urine was 250 cc. and the largest single day volume was 75 cc.; the urea chloride index was 20.

Case 2.—L. P., a 28-year-old white man, was well until November, 1949, when he began to notice numbness, coldness, and a pallor of his hands and feet and intermittent periods of nausea, vomiting, and diarrhea, lasting two to three days. His strength decreased rapidly, and he had periods of vertigo and one short period of unconsciousness, with spontaneous recovery. By February, 1950, he noticed that his skin had darkened and that he had lost 40 lb. (18.1 kg.). When he entered the hospital for diagnosis and treatment, he was so weak that the slightest effort exhausted him. On admission, he appeared to be chronically ill, showing a marked degree of weight loss and fatigue. Patches of brownish pigmentation were noted on the oral mucous membranes, in creases, and at pressure points. Blood pressure was 80/40. Body and axillary hair was sparse. The pubic hair and genitalia were normal. Except for slight generalized lymphadenopathy, results of physical examination were normal. A roentgenogram of the chest for tuberculosis was normal, as was a roentgenogram of the adrenal area. Administration of 0.3 cc. of epinephrine resulted in a drop of 65% in the circulating eosinophils. On the basis of this, a six-day period of corticotropin (ACTH) therapy, 20 to 40 mg. daily, was instituted, without benefit. Shortly after this, a mild Addisonian crisis developed. After recovery, the patient was placed on a daily regimen of 5 mg. of desoxycorticosterone acetate by injection, 3 gm. of sodium chloride in addition to the sodium chloride contained in a high protein diet, and 30 mg. of methyltestosterone. Symptomatic improvement was noted with this regimen. However, the patient was unable to return to his previous occupation of truck driving and was able to follow only a limited program of physical activity. In October, 1950, he contracted an upper respiratory infection; this was followed by an acute Addisonian crisis. In January, 1951, his condition was reevaluated. His skin had become more deeply pigmented, and the lymphadenopathy had persisted. Blood pressure was 110/80. He was given a daily dose of 25 mg. of cortisone orally, and in approximately 10 days he began to note gain in strength and well-being. In three weeks he was on a program of full physical activity, without fatigue. In two months, while receiving cortisone in doses varying from 12.5 to 100 mg. daily, he gained 30 lb. (13.6 kg.). All evidence of asthenia disappeared. The patient said that he felt as well while receiving 12.5 mg. as he did while receiving 100 mg. of cortisone daily. There was no decrease in skin pigmentation, and libido and potentia coeundi remained unaltered.

The following laboratory results were obtained before cortisone therapy was instituted. The glucose tolerance curve after ingestion of 100 gm. of glucose was: fasting, 102 mg. per 100 cc.; after one-half hour, 110 mg.; after one hour, 130 mg.; after two hours, 138 mg.; and after three hours, 110 mg. per 100 cc. Serum sodium was 135 mEq per liter; serum potassium was 4.5 mEq per liter; serum chloride was 105 mEq per liter; and carbon dioxide was 24 mEq per liter. The blood urea nitrogen level was 16 mg. per 100 cc.; urinary 17-ketosteroids were 4.4 mg. in 24 hours, and 11-oxysteroids were 1.26 mg. in 24 hours. Water tests were positive; the total night urine volume was 190 cc., and the largest single day urine volume was 75 cc.; the urea chloride index was 9.

The following laboratory results were obtained two months after cortisone therapy, on the dosage schedule given above, was instituted. The glucose tolerance curve, after ingestion of 100 gm. of glucose was: fasting, 78 mg. per 100 cc.; after one-half hour, 134 mg. per 100 cc.; after one hour, 155 mg.; after two hours, 98 mg.; and after three hours, 30 mg. per 100 cc. Blood chemistry determinations were the same as before cortisone therapy was instituted; urinary 17-ketosteroids were 6.2 mg. per 24 hours, and 11-oxysteroids were 3.26 mg. per 24 hours. Results of water tests remained positive, with the administration of doses of 25, 50, and 100 mg. of cortisone daily; each dose was given for a period of at least one week but was omitted on the morning of the water test. After two weeks of treatment with 25 mg. of cortisone daily, at 8:30 a. m. on the morning of the water test, the patient was given a single dose of 100 mg. of cortisone in tablet form, and, for the first time, the results of the test were normal. The result of a test on the following day, preceded by the administration of 12.5 mg. of cortisone, was also normal.

Case 3.—R. E. B., a 30-year-old white man, complained of weakness, weight loss, nausea, and vomiting. He first was diagnosed as having Addison's disease in 1945, while in the Southwest Pacific. He had been maintained on a regimen of desoxycorticosterone acetate implants of 800 to 1,000 mg. at intervals of 10 to 12 months. Except for the decrease in work capacity and recurrent attacks of severe hypoglycemia, he felt fairly well. In December, 1950, daily administration of 5 mg. of desoxycorticosterone acetate, by buccal absorption, and 10 mg. of sodium chloride, in tablet form, was started. Examination revealed a well-developed man with moderate pigmentation. He gave the impression of having a low degree of intelligence, although he had an excellent record as a student and had graduated from the United States Naval Academy. His blood pressure was 128/80. Except for mild bilateral gynecomastia, results of the physical examination were essentially normal. On April 5, 1951, after a period of unconsciousness that lasted 36 hours, he was admitted to the hospital. The coma had been caused by prolonged hypoglycemia. Blood sugar, on his admission to another hospital, was 30 mg. per 100 cc. (Folin and Wu method). Physical findings were unchanged except for the disappearance of the gynecomastia. Because of the obvious hypoglycemia and mental changes, treatment with 50 mg. of cortisone daily was started. In 10 days he began to manifest subjective improvement, and after two weeks he stated that he felt better than at any time since the onset of his illness.

The following laboratory results were obtained before cortisone therapy was instituted. A roentgenogram of the thorax for pulmonary tuberculosis was normal, as was a roentgenogram of the adrenal area for calcification. The glucose tolerance level, after ingestion of 100 gm. of glucose, was: fasting, 48 mg. per 100 cc.; after one-half hour, 114 mg.; after one hour, 126 mg.; after two hours, 175 mg.; and, after three hours, 92 mg. Serum sodium was 134 mEq per liter; serum potassium was 4.6 mEq per liter; chloride was 108 mEq per liter; and carbon dioxide was 26 mEq per liter. The blood urea nitrogen level was 18 mg. per 100 cc.; urinary 17-ketosteroids were 4.4 and 5.5 in 24 hours; 11-oxysteroids were 0.75 mg. in 24 hours. The water test was positive in both parts. The night urine volume was 280 cc., and the largest single day volume was 180 cc.; the urea chloride index was 11.

The following laboratory results were obtained after cortisone therapy, 50 mg. daily in one dose, was instituted. The glucose tolerance curve, after ingestion of 100 gm. of glucose was: fasting, 86 mg. per 100 cc.; after one-half hour, 110 mg.; after one hour, 114 mg.; after two hours, 62 mg.; and, after three hours, 78 mg. per 100 cc. The serum sodium level was 137 mEq per liter; blood chemistry determinations were otherwise the same as before cortisone therapy was instituted. Urinary 17-ketosteroids were 5.9 mg. in 24 hours, and 11-oxysteroids were 4.25 mg. in 24 hours. The water test was slightly positive in part one but negative in part two. The night urine volume was 510 cc., and the largest day volume was 470 cc.; the urea chloride index was 59.

Case 4.—F. McC., a 58-year-old white man, had his first attack of Addison's disease in 1946; it was characterized by weakness, weight loss, nausea, vomiting, and persistent fever. At that time, deep pigmentation of the exposed areas of the skin was noted. Blood pressure averaged 100/80. Roentgenograms of the chest revealed old healed bilateral apical pulmonary tuberculosis. No calcification of the adrenals was found. Daily treatment was started with 2.5 mg. of desoxycorticosterone acetate given intramuscularly and 2 gm. of sodium chloride by mouth. The patient remained in a decidedly weakened state until 1949, when treatment with desoxycorticosterone acetate pellet implants was started, with general improvement. The effect of an implant of 1,000 mg. lasted 10 to 14 months. In April, 1950, the patient had an acute febrile episode, with moderate nausea and vomiting but no signs of an Addisonian crisis. At that time, he appeared well developed and well nourished. His skin and oral mucous membrane were moderately pigmented. He had normal facial and axillary hair but no hair on his chest; pubic hair was sparse and of female configuration. Blood pressure was 130/80. The testes were small but of normal consistency. Results of the rest of the examination were essentially normal. During this febrile episode, the patient was given 200 mg. of cortisone and 5 mg. of desoxycorticosterone acetate daily, with salt and glucose intravenously. His recovery was uneventful. Oral cortisone therapy, 25 mg. daily, was begun on March 15. One week after this treatment was started, the patient felt stronger and the result of a water test was normal. Two weeks later, the dose of cortisone was reduced to 12.5 mg. daily, with continued improvement in strength and well-being. The patient continued to receive daily, 12.5 mg. of cortisone orally and 3 mg. of desoxycorticosterone acetate intramuscularly, along with 2 gm. of sodium chloride.

The following laboratory results were obtained before cortisone therapy was instituted. The urinary sodium excretion averaged 7.5 gm. per 24 hours. The glucose tolerance curve after ingestion of 100 gm. of glucose was: fasting, 58 mg.; after one-half hour, 106 mg.; after one hour, 118 mg.; after two hours 50 mg.; and after three hours, 94 mg. per 100 cc. Serum sodium was 139 mEq per liter; serum potassium was 4.4 mEq per liter; chlorides were 100 mEq per liter; and carbon dioxide was 27 mEq per liter. The blood urea nitrogen level was 14 mg. per 100 cc. The water test showed that the night volume of urine was 250 cc., and the largest single day volume was 40 cc.; the urea chloride index was 1.

The following laboratory results were obtained after cortisone was administered for three weeks, in doses of 25 mg. daily, and then in doses of 12.5 mg. daily. The urinary sodium excretion averaged 3.4 gm. in 24 hours. The blood chemistry determinations were essentially normal; the urinary 17-ketosteroids were 5.7 mg. in 24 hours, and urinary 11-oxysteroids were 2.02 mg. in 24 hours. The water test, performed while the patient was receiving 12.5 mg. of cortisone orally, was negative in both parts; the night urine volume was 250 cc., and the largest single day volume was 590 cc.; the urea chloride index was 92.

Case 5.—J. A., a 43-year-old white man, had been diabetic since 1936. In May, 1949, a diagnosis of Addison's disease was made.[6] Weakness, exhaustion, cutaneous pigmentation, hypotension, and anemia were present. The result of a water test was positive. Blood chemistry determinations resembled those found in adrenal cortical insufficiency. Urinary 17-ketosteroid excretion was 2.6 mg. and 3.0 mg. in 24 hours, and urinary corticosteroid excretion was 1.06, 0.66, and 0.73 mg. on three occasions, a value considered normal by the method used. A daily dose of 12 units of protamine zinc insulin and 26 units of regular insulin was required to control the diabetes mellitus; this was little less than that required before the onset of Addison's disease. The normal urinary oxysteroid excretion and relatively high insulin requirement cast some doubt on the diagnosis of Addison's disease; however, by December, 1949, the patient was required to take 1 to 2 cc. of lipo-adrenal cortex daily, in order to avoid hypoglycemia. This enabled him to continue his accustomed dose of insulin. At this time, he was also taking 30 mg. of methyltestosterone daily. In October, 1950, the patient had a severe insulin reaction, followed by an Addisonian crisis in which his daily insulin requirement dropped to 2 to 4 units of regular insulin. Large amounts of aqueous adrenal cortex and lipo-adrenal cortex were necessary at this time. In December, 1950, examination revealed a well-developed, markedly asthenic, pale, moderately pigmented person. Pigmentation of the lips and mucous membranes was pronounced, as was asthenia. Blood pressure was 110 to 120/80. Body hair, other than pubic, was absent, and facial hair was normal. The results of examination were otherwise normal. Intramuscular treatment with 25 mg. of cortisone daily was started. In January, 1951, oral cortisone therapy, in the same dosage, was begun. The patient stated he felt better during oral than during intramuscular treatment. The insulin dosage remained unchanged. Attacks of hypoglycemia disappeared, and the patient's diabetic control improved markedly, with less glycosuria. In March, 1951, the patient changed to NPH-50 insulin, at which time it was necessary to increase his insulin dose to 52 units daily. His diabetes remains well controlled, without attacks of hypoglycemia and with urinary glucose averaging 6 gm. per 24 hours. In addition to the daily dose of 25 mg. of cortisone taken by mouth, the patient receives 4 mg. of desoxycorticosterone acetate by buccal absorption. The cutaneous pigmentation has decreased, and the pubic hair is more profuse; libido and potentia coeundi are unchanged. The patient has gained 16 lb. (7.3 kg.) since starting cortisone therapy. His daily diet contains 80 gm. of protein, 185 gm. of carbohydrate, and 157 gm. of fat. He has a constant feeling of well-being and is able to be fully active throughout the day without undue fatigue.

The following laboratory results were obtained before cortisone therapy was instituted. Roentgenogram examination of the chest revealed calcified right hilar nodes, and a roentgenogram of adrenal areas showed no calcification. Fasting blood sugar, after a 12 hour fast, was 50 mg. per 100 cc. (Folin and Wu method); serum sodium was 142 mEq per liter; potassium was 4.5 mEq per liter; and chloride was 102 mEq per liter. The blood urea nitrogen level was 16 mg.; urinary 17-ketosteroids were 2.3 and 3.0 mg. per 24 hours; 11-oxysteroids were 1.06, 0.66, and 0.73 mg. per 24 hours. A water test performed in 1949 showed positive results. The night urine volume was 710 cc., and the largest single day volume was 135 cc.; the urea chloride index was 5.

The following laboratory results were obtained after cortisone had been administered for three months, in doses of 25 mg. orally, daily. The fasting blood sugar, after 18 hours fast, was 120 mg. per 100 cc. (Folin and Wu method); the blood chemistry determinations remained essentially unchanged; urinary 17-ketosteroids were 7.8 mg. per 24 hours; 11-oxysteroids were 2.3 mg. per 24 hours. The water test was negative in both parts; the night urine volume was 310 cc., and the largest single day volume was 400 cc.; the urea chloride index was 40.

Case 6.—E. M. M., a 41-year-old white woman, was operated on in 1947, at the Mayo Clinic, for the intracapsular removal of a chromophobe adenoma of the pituitary. Postoperatively, she showed signs of adrenal cortical insufficiency and was maintained on a daily regimen of 10 cc. of aqueous adrenal cortex and 2 mg. of desoxycorticosterone acetate given intramuscularly, 0.5 grain (0.03 gm.) of thyroid, 10 mg. of methyltestosterone, and 0.5 mg. of diethylstilbestrol given orally. No 17-ketosteroids were demonstrable in the urine, and blood chemistry determinations were compatible with the impression of adrenal cortical insufficiency. Early in 1948, the patient, because of recurrent attacks of hypoglycemia, was treated with lipo-adrenal cortex,

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[6] Ward, E.; Parkin, T. W., and Howell, L. P.: Diabetes Mellitus and Addison's Disease: Report of a Case with Normal Urinary Corticosteroids and High Insulin Requirement, Proc. Staff Meet., Mayo Clin. 25: 145 (March 29) 1950.

1 cc. daily, in place of aqueous adrenal cortex extract. She remained well, except for mild symptoms of adrenal cortical insufficiency induced by excessive fatigue or occasional upper respiratory infections. By June, 1950, she had undergone marked masculinizing changes, with facial acne and hirsutism, enlargement of the clitoris, and deepening of the voice. Methyltestosterone therapy was discontinued, and the changes disappeared. In January, 1951, the patient appeared well developed and well nourished, and with a fair complexion. The left frontotemporal depression of the skull, at the site of the pituitary operation, was visible. There were numerous acneform scars on the face. The scalp and pubic hair was abundant, but axillary hair was sparse. The breasts were full, but little breast tissue was palpable. The pelvic organs were normal. Blood pressure was 120/70. Results of physical examination were otherwise normal. Oral cortisone therapy, in doses of 25 mg. daily, was started. Administration of thyroid and estrogenic hormone was continued as before, and desoxycorticosterone acetate, 4 mg., was taken by buccal absorption. After 10 days of cortisone therapy, there was a definite increase in strength and well-being. After three weeks, the dose of cortisone was reduced to 12.5 mg. daily. The patient gained 10 lb. (45 kg.) over a two month period, without evidence of fluid retention. She felt well while receiving 12.5 mg. of cortisone orally, 4 mg. of desoxycorticosterone acetate by buccal absorption, 1 grain (0.06 gm.) of thyroid, and 0.05 mg. of ethinyl estradiol. She is able to perform her housework with ease, and, for the first time in many years, she is able to engage in outside activities. Menses, absent since 1943, recurred after one month of cortisone therapy and now occur regularly, every 28 days. There has been a recent slight, but definite, increase in facial hair.

The following laboratory results were obtained before cortisone therapy was instituted. The blood chemistry determinations of serum sodium, potassium, and chloride were within normal limits; no 17-ketosteroids were found in the urine (1949).

The following laboratory results were obtained after four months of cortisone therapy, with a single daily dose of 12.5 mg. The glucose tolerance curve after ingestion of 100 gm. of glucose was: fasting, 87 mg.; after one-half hour, 133 mg.; after one hour, 136 mg.; after two hours, 131 mg. and after three hours, 66 mg. per 100 cc. (Folin and Wu method). The blood chemistry determinations remained within normal limits; the urinary 17-ketosteroids were 4.2 mg. in 24 hours, and the 11-oxysteroids were 1.0 mg. in 24 hours. The water test was slightly positive; the total night volume of urine was 420 cc., and the largest single daily volume was 370 cc.; the urea chloride index was 30.

COMMENT

In all patients, clinical improvement was preceded by a lag period of 5 to 10 days. This delay in response was noted whether cortisone was given in single dose or in divided daily doses of 12.5 to 50 mg., without regard to the size of the initial dose. It may be that this period of time is required to overcome the inertia of cellular reactions, which are at low ebb in the presence of inadequate amounts of adrenal cortical hormones. A dose of 6.25 mg. twice daily was generally sufficient to produce slight improvement in strength and well-being; administration of 12.5 mg. once daily was more effective, and the ingestion of 25 mg. once daily induced the maximal response. When cortisone was given in a single daily dose, there was no diminution in clinical response. Indeed, the patients stated they felt better when the cortisone was given in this manner than when it was given in two or three divided doses throughout the 24 hours.

Once improvement in strength and well-being began, the change was dramatic, reaching a plateau in approximately 30 days. Increasing the dose of cortisone above 25 mg. was then without further benefit. In three cases, it was possible to maintain improvement with a dose of 12.5 mg. daily. In five patients, appetite improved with concomitant weight gain; in the sixth, the weight remained constant. Euphoria and optimism were evident. The patients, after one month of cortisone therapy, were able to resume, without undue fatigue, a program similar to that followed before the development of adrenal cortical insufficiency.

Carbohydrate Metabolism.—The tendency toward hypoglycemia, evident in many cases of adrenal cortical insufficiency, is prevented by parenterally administered cortisone.[7] This effect is present when cortisone is used orally. In those instances in which the fasting blood sugar levels remained in the hypoglycemic range and the three-hour values of the glucose tolerance test were dangerously low, the patients did not show the symptoms of hypoglycemia previously seen at such blood sugar levels. Thus, a resistance to the symptoms of hypoglycemia was demonstrated. In the patient with diabetes mellitus and Addison's disease, hypoglycemic reactions to insulin were prevented by the oral administration of 25 mg. of cortisone daily, with only a slight rise in insulin requirement, which may have been due to increase in diet. This increase in insulin requirement is in keeping with the observations of others.[8] The tendency for carbohydrate tolerance to be reduced by cortisone therapy may have been counterbalanced, in this patient, by the marked increase of physical activity noted since the start of cortisone therapy. However, this patient has had a relatively high daily insulin requirement and normal urinary corticosteroids since the onset of adrenal cortical insufficiency. The explanation of this phenomenon is obscure.

In general, the dose of cortisone given orally to produce satisfactory clinical remission in adrenal cortical insufficiency did not significantly alter carbohydrate tolerance, as demonstrated by the three-hour result of the glucose tolerance test, other than to tend to prevent hypoglycemia and improve the patients' ability to withstand fasting and to decrease the sensitivity to low blood sugar levels.

Urinary Steroid Excretions.—Alteration of excretion of urinary 17-ketosteroids was not remarkable. In several instances, the urinary 17-ketosteroids were increased but not to normal or near normal levels. Little change might be anticipated in the urinary 11-oxysteroid excretion with such small doses of cortisone, since at most only 5% of administered cortisone appears in the urine as corticosteroids.[8a] In two patients, a moderate increase in urinary 11-oxysteroid excretion was noted.

Serum Electrolytes.—When treatment with cortisone was started, a normal blood electrolyte pattern was present in all cases. In no instance was any change from the normal induced by the administration of cortisone. This might have been anticipated, since the patients were receiving desoxycorticosterone acetate in amounts sufficient to maintain electrolyte balance, whereas cortisone has been found to be approximately one-fiftieth as effective as desoxycorticosterone acetate in causing retention of sodium.[1e] Sprague and his associates observed virtually no effect on the blood electrolytes when 100 mg. and 50 mg. of cortisone were administered daily in two patients with Addison's disease, who were receiving desoxycorticosterone acetate and 8 gm. of sodium chloride daily.[1f] In this study, all additional sodium chloride rations were discontinued when oral cortisone therapy was begun. Stopping the added daily ingestion of sodium chloride had no deleterious effect on the patients, and it did not alter the electrolyte concentrations in the blood.

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[7] Sprague, Kepler, Keating, and Power.[1b] Perera, Pines, Hamilton, and Vislocky.[1c] Thorn and others.[1c] Sprague, R. G.; Mason, H. L., and Power, M. H.: *Studies of the Effects of Adrenal Cortical Hormones on Carbohydrate Metabolism in Human Subjects,* Proc. Am. Diabetes A. **9**: 149, 1949.

[8] Perera, Pines, Hamilton, and Vislocky.[1c] Boland, E. W., and Headley, N. E.: Effects of Cortisone Acetate on Rheumatoid Arthritis, J. A. M. A. **141**: 301 (Oct. 1) 1949.

[8a] Thorn, G. W., and others: Medical Progress: The Clinical Usefulness of ACTH and Cortisone, New England J. Med. **242**: 783 (May 18) 1950.

Response to Ingestion of Water, as Demonstrated by the Robinson-Power-Kepler Water Test.—The occurrence of false positive results of water tests, in the patients studied, had been ruled out.[9] Results of repeated water tests previous to cortisone therapy were positive. After cortisone therapy was instituted, the patients had less difficulty in drinking the amount of water necessary for the test, and in five of the six patients there was marked improvement in diuretic response. In two patients, the water test results reverted to normal when they were given 25 mg. or less of cortisone daily; in a third, it became normal when, after a week of treatment with 25 mg. of cortisone daily, 100 mg. of cortisone was given on the morning of the water test. This reaction recurred despite the fact that results of the test had been repeatedly positive when 100 mg. of cortisone was given daily and the dose was omitted on the morning of the test. In two other patients, one of whom (E. M. M.) was taking 25 mg. of cortisone daily and the other (R. E. B.) was taking 50 mg., the urea chloride index became normal, and the difference between the largest daytime volume of urine passed and the night volume was in the range of 20 to 50 cc. This represents an equivocal response and may be considered normal. These findings are not in keeping with those of Thorn and his associates,[10] who stated that, in the majority of cases, the reversal of the results of the water test requires a larger dose of cortisone alone than of cortisone in combination with adequate doses of desoxycorticosterone acetate; this combination is capable of inducing optimal symptomatic improvement in patients with Addison's disease. There was no change in the result of the water test of patient A. B. while he was receiving cortisone. The return of the diuretic response to normal, with cortisone therapy, may depend on the capacity of the renal tubular cells to respond to the changes produced by cortisone either acting directly on the cells or in some way interfering with the production, transport, or utilization of the pituitary antidiuretic hormone.[11] A larger series of cases will be necessary to permit accurate determination of the effect of cortisone on the water test.

Miscellaneous Observations.—There was no change in the blood pressure of the patients studied when cortisone was administered. There was, however, a marked subjective and objective increase in skin temperatures, with less discomfort on exposure to cold and to heat. Three patients noted a definite decrease in skin pigmentation; in the other three, there was little or no change. On direct questioning, the five patients with primary adrenal cortical failure noted no change in libido or potentia coeundi. E. M. M. noted a marked decrease in this regard when she discontinued testosterone therapy; no further change occurred with cortisone therapy. The anemia present in four of the patients before cortisone therapy responded well to this medication. Electrocardiographic findings in the patients studied were not unusual.

SUMMARY

The effect of oral cortisone therapy in four patients with primary chronic adrenal cortical insufficiency, one patient with primary chronic adrenal cortical insufficiency and diabetes mellitus, and one patient with chronic adrenal cortical insufficiency secondary to surgical removal of a chromophobe adenoma of the pituitary was studied over a period of three to five months. The optimal dose of cortisone required to induce satisfactory clinical remission in these patients was 12.5 mg. to 25 mg. daily. This was best given in a single daily dose.

In this dosage, cortisone produced dramatic clinical improvement in strength and well-being after a lag period of approximately one week. Maximal improvement occurred in three to four weeks after medication was started. The patients felt as well with doses of 12.5 mg. to 25 mg. as they did with doses of 100 mg. of cortisone daily. There were no significant changes in the glucose tolerance curves. Decreased sensitivity to hypoglycemia resulted, and there was some increase in urinary excretion of 17-ketosteroids and, in two cases, 11-oxysteroids. Oral cortisone therapy produced no significant changes in blood chemistry determinations; it caused the result of the Robinson-Power-Kepler water test to revert to normal in three cases and equivocal results of a similar test in two others; in one case the result continued to be positive.

CONCLUSION

Oral administration of cortisone in conjunction with the use of conventional doses of desoxycorticosterone acetate by buccal absorption is effective and valuable in cases of chronic adrenal cortical insufficiency. There were apparently no deleterious effects with the dosage employed (12.5 to 100 mg. daily).

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9. Levy, M. S.; Power, M. H., and Kepler, E. J.: The Specificity of the "Water Test" As a Diagnostic Procedure in Addison's Disease, J. Clin. Endocrinol. **6**: 607 (Sept.) 1946.

10. Thorn, G. W., and others: Advances in the Diagnosis and Treatment of Adrenal Insufficiency, Am. J. Med. **10**: 595 (May) 1951.

11. Gaunt, R.; Birnie, J. H., and Eversole, W. J.: Adrenal Cortex and Water Metabolism, Physiol. Rev. **29**: 281 (Oct.) 1949.

Emotional Reactions to Disease.—No one can tell what will be his own reaction to the belief that he has a fatal illness. It is difficult to imagine being without a forward outlook, to know that one's course will be inevitably downward. Hopelessness has a highly morbific effect. Some bear it with resignation. Some refuse to accept it, question the diagnosis and persist in seeking further advice and newer or different treatments. Some fortunate people bear it with fortitude and remain interested in other people and their activities. Some become disagreeable, ugly and unpleasant, jealous of the health enjoyed by others and angry that they should be hopelessly ill. These unhappy people are difficult to help. Almost no one bears it with equanimity. Almost without exception the patient loses energy and feels a lassitude, a weakness and fatigue bordering on exhaustion; symptoms due to the emotional disturbance quite apart from those directly caused by the lesion.—R. Ian MacDonald, M.D., and R. F. Farquharson, M.B., Emotional Manifestations Associated with Structural Disease, *The Medical Clinics of North America,* March, 1952.

J.A.M.A., May 31, 1952

SELECTION OF DUODENAL ULCER PATIENTS FOR VAGOTOMY

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Vagotomy in the surgical treatment of duodenal and anastomotic peptic ulcers has been reported as a satisfactory procedure by large clinics with a wide experience with this method.[1] In our experience with more than 600 vagotomies, success has depended on the following four factors: (1) a careful selection of patients, (2) the skill and experience of the surgeon in achieving a complete vagotomy, (3) the incorporation of a drainage procedure, preferably pyloroplasty, to avoid retention, and (4) the prolonged postoperative management of the patient until gastrointestinal function has been readjusted.

We wish to report in this paper our experience with the selection of patients for surgery. This subject needs much more careful attention and emphasis than it has received in the medical literature. The accompanying table illustrates the contrast in percentage distribution of patients by the primary indications for surgery between the first 350 cases [1d] in our series and the latest 100. The striking feature is the marked diminution in the number of vagotomies done for intractable ulcer, with a corresponding increase in those done for other major indications. It is our present opinion that the change has resulted from the introduction of methantheline (banthine®) bromide and tetraethylammonium (etamon®) loride as adjuncts to medical therapy and from the reater use of the psychological approach to diagnostic appraisal and therapy.

*Primary Indications for Vagotomy in Two Series of Cases**

Primary Indication for Surgery	Group of First 350 Vagotomies, %	Group of 100 Most Recent Vagotomies, %
Inadequate medical response (intractable pain, intractable ulcer)	57	25
Hemorrhage	34	34
Pyloric obstruction	7	28
Multiple perforations	2	5
Diagnostic exploration	0	6
Occupational or economic necessity	0	2

* Multiple indications for entire group, 38%. Peak incidence of surgical complications, fourth year of illness, with the majority of cases occurring between second and sixth year of illness.

INTRACTABLE ULCER

It should be emphasized that the appraisal of response to medical therapy must not be left entirely to the judgment of the patient or his own private physician, unless detailed factual information regarding the therapy can be obtained. We have made it a practice to make an independent observation for a period of at least eight weeks on an ambulatory basis, followed by a period of hospitalization if the patient fails to respond. In general, the patients who respond poorly to optimal medical management fall into two fairly well defined groups: (1) the organic group, comprising those who show considerable objective evidence of organic pathology, such as large craters, penetrating craters, inflammatory masses, and marked duodenal deformities, usually with at least a partial pyloric obstruction, and (2) the psychosomatic group, comprising those who show minimal evidence of ulcer pathology but have a large overlay of psychic distress. This classification is not to be regarded as hard and fast, since there is overlapping of these two groups, but it serves as a basis for the selection of cases for definitive surgery. Our own experience to date leads us to believe that psychic factors coexist in both groups. In the organic group our major emphasis has been to bring to bear the entire armamentarium of therapy in order to achieve healing with a strict avoidance of the psychotherapeutic approach until the organic lesion is well healed. In these patients psychologic probing frequently aggravates the illness. It is in this group that the use of methantheline and tetraethylammonium has been of distinct advantage. However, it must be borne in mind that these drugs have their limitations. Of 25 recent patients who eventually were treated by vagotomy, 17 failed to attain full relief with methantheline for one reason or another. Six of these had partial obstruction that was aggravated by methantheline. This effect of this drug in certain cases of partial obstruction is now well known and is presumed to be due to its effect of producing a considerable reduction in gastric tone. In the others, symptoms continued despite a complete hospital regimen supplemented by the use of methantheline in dosages varying from 400 to 800 mg. daily for periods ranging from two to four weeks. We have not as yet analyzed our total experience with methantheline, which at the moment is a favorable one, but we wish to make the point that there is no drug that can safely and continuously block vagal stimuli completely. In this sense, methantheline or tetraethylammonium cannot be regarded as equal substitutes for surgical vagus section.

In the predominantly psychosomatic group our emphasis has shifted to the use of psychologic methods both for diagnostic appraisal and therapy. In these patients the usual ritual of the bland diet, the milk bottle, and a variety of pills and medicines imposes such restrictions on the normal routine of living that they frequently rebel and stop therapy at the earliest moment of freedom from symptoms. The inevitable result is relapse. Since it is now known that after each remission these patients continue to show high rates of gastric secretion, it follows that ef-

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Reviewed in the Veterans Administration and published with the approval of the chief medical director. The statements and conclusions published by the authors are the result of their own study and do not necessarily reflect the opinion or policy of the Veterans Administration.

[1] (*a*) Dragstedt, L. R., and Woodward, E. R.: Appraisal of Vagotomy for Peptic Ulcer After Seven Years, J. A. M. A. **145:** 795 (March 17) 1951. (*b*) Crile, G., Jr., and Brown, G. M., Jr.: Vagotomy as a Treatment for Marginal Ulcer, Gastroenterology **17:** 14, 1951. (*c*) Crile, G., Jr.: Management of Peptic Ulcer, Postgrad. Med. **8:** 28, 1950. (*d*) Weinberg, J. A.; Kraus, A. R.; Stempien, S. J., and Wilkins, F. B.: Vagotomy in the Treatment of Duodenal Ulcer: Results in 350 Consecutive Cases, A. M. A. Arch. Surg. **62:** 161, 1951. (*e*) Grimson, K. S., and others: Vagotomy: Observations During 4 Years, Surgery **27:** 49 (Feb.) 1950.

fective medical treatment would have to be continuous. This, of course, would lead to an enslavement of the patient not only by his disease but also by his treatment. The only logical alternative is to attempt a major psychologic reorientation of these patients through appropriate psychotherapy, in order to achieve a major remission in the pathologic physiology of the stomach. The lack of the psychologic approach remains the most glaring deficiency in the medical management of the ulcer patient. Vagotomy or any other surgical procedure will not cure these patients of their total disease.

HEMORRHAGE

Massive hemorrhage from peptic ulcer is such an immediate potential threat to life that serious consideration should be given to its prevention and immediate control. Surgery is indicated as an emergency procedure if the medical control of hemorrhage fails and as an elective procedure in order to prevent hemorrhage from renewed ulceration. Our own data [1d] would indicate that vagotomy is an important adjunct in both instances. In the emergency situation, if the patient fails to respond favorably after the most complete antiulcer regimen and adequate blood replacement within a period of 48 hours, surgical interference is usually recommended. The surgical effort is directed at the control of bleeding by ligation of the bleeding vessel. If the patient withstands this procedure well in the judgment of the surgeon, a vagotomy is added. As for the elective procedure, it is our present rule to regard as a candidate for definitive surgery any patient who has had two or more hemorrhages requiring blood transfusions, regardless of his age, and any patient over 40 who has had a single massive hemorrhage due to ulcer.

OBSTRUCTION

Unremitting pyloroduodenal obstruction due to ulcer formation is so obviously a serious organic complication that surgical relief is imperative. The object of surgery is to remove or circumvent the obstruction by either a pyloroplasty or a gastroenterostomy. The addition of vagotomy has for its object the healing of the attendant ulcer and the prevention of its recurrence. In our clinic preference is given to pyloroplasty as the drainage procedure of choice for the following reasons: 1. Surgical exposure of the ulcer bearing area permits accurate diagnosis and localization. 2. There is a lessened tendency for the occurrence of the dumping syndrome. 3. There is a diminished frequency of postoperative gastritis, a complication that is much more frequent with gastroenterostomy. 4. Pyloroplasty eliminates the possibility of a later anastomotic ulcer in case the vagotomy should be incomplete. There are two additional points that remain to be emphasized in the management of ulcer patients with pyloric obstruction. There are some patients with a high grade of pyloric obstruction in whom the diagnosis is unnecessarily delayed because they do not vomit. These patients usually have large dilated stomachs that have lost their power of reverse peristalsis. Because of this lack of vomiting, they are usually in fairly good electrolytic balance, but an imbalance is likely to develop readily should vomiting occur or should continuous gastric suction be instituted. Once such a grade of obstruction has been demonstrated by barium study, the stomach should be completely emptied of barium by a large stomach tube and should be decompressed by continuous gastric suction for at least three days, followed by nightly emptying of the stomach contents by tube. Bland liquids and antacids should be used, but methantheline and atropine are usually contraindicated, because of their effect in further reducing tone of the stomach. It should be emphasized that the institution of continuous gastric suction is an immediate indication for daily replacement of water, sodium chloride, and potassium. There is also a group of patients with partial pyloric obstruction accompanied by a marked motor irritability of the stomach and duodenum, resulting in frequent and profuse vomiting. These patients frequently come in with marked electrolytic imbalance and dehydration despite the fact that subsequent x-ray examination may reveal little or no retention of barium beyond the six-hour period. In these patients the management should include full and complete atropinization and, most important of all, the restoration of fluids and electrolytes to normal.

MULTIPLE PERFORATIONS

Multiple perforations are regarded as an indication for vagotomy especially in those patients in whom perforation occurs without previous warning. There are some patients in whom the characteristic pattern of ulcer relapse is one of perforation without the occurrence of prodromal symptoms. Since these patients cannot be given continuous therapy, the interruption of this recurrence of perforation by definitive surgical means is usually necessary. Our data [1d] indicate that vagotomy is as satisfactory as any other surgical procedure in accomplishing this.

DIAGNOSTIC EXPLORATION

In a few cases, the primary surgical purpose has been one of diagnostic exploration in situations where the lesion could not be definitely localized and the problem of possible pyloric carcinoma was present. If the exploration revealed the lesion to be a benign duodenal ulcer, vagotomy and pyloroplasty were performed.

OCCUPATION AND ECONOMIC NECESSITY

The patient's occupation may be such that even a conscientious effort at medical treatment is not very rewarding. In our surgical group of patients, fully two-thirds have had one or more recurrences of ulcer annually. Such frequency of recurrences also imposes a considerable economic burden on the patients, both as a result of work stoppage and as a result of the expense of treatment. As is shown by our data (see accompanying table) we do not deal with this indication liberally.

ANASTOMOTIC ULCERS

It is now generally agreed that vagotomy has its greatest usefulness in the surgical management of anastomotic ulcers, whether they are present after gastrectomy or after gastroenterostomy. At this hospital we also give serious consideration to the feasibility of substituting a pyloroplasty for the gastroenterostomy. We are impressed by the frequent occurrence of gastritis in patients subjected to gastroenterostomy and feel that this can be minimized by the elimination of the anastomosis and a restoration of the normal gastrointestinal lumen. In many instances the recurrence of symptoms after vagotomy and gastroenterostomy is not due to recurrence of ulcer but rather due to the development of a postoperative gastritis.

SUMMARY

Any surgical procedure, including vagotomy, should be used with reluctance in a patient who is thought to have an intractable ulcer. It may be that the patient and not the ulcer is intractable. Only after complete and total medical management fails should surgical interference be recommended. This medical management should include, when indicated, the use of methantheline (banthine®) bromide, tetraethylammonium (etamon®) chloride, and appropriate psychotherapy. In most instances vagotomy, as well as any other surgical procedure, should be reserved for the serious organic complications, such as obstruction, hemorrhage, multiple perforations, and anastomotic ulcers.

INTRA-ARTERIAL INFUSION—SIMPLIFIED TECHNIQUE

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and
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Halsted[1] was the first in this country to use the arterial route for blood replacement when, in 1883, he bled patients suffering from carbon monoxide poisoning via the radial artery and, after whipping the blood in air, replaced it through the same artery. Little further use of this route was made until 1939, when Colonel Sam Seeley suggested the technique to Kohlstaedt and Page.[2] Since then many excellent reports have appeared attesting to its effectiveness in shock therapy.[3] Many different techniques have been described, all either complicated or requiring expensive apparatus.[4] There has been a high incidence of circulatory disturbances of the arm and hand among the reported cases, and some authors feel that it is only justified as a life-saving measure.[4b]

It is the purpose of this paper to present a simplified technique that has been found extremely effective and free of circulatory complications to date.

APPARATUS

This technique is adaptable to any commercial blood, plasma, or gelatin bottle having a needle air-vent. A recipient set that will withstand a pressure of 300 mm. of mercury can be used, and any of the companies producing expendable equipment for blood administration can supply a satisfactory set. Nonexpendable recipient sets can be used, if desired, by reinforcing weak points with adhesive tape. Ordinary blood bottles of the Baxter or Cutter type have been successfully used. The regular plastic expendable recipient sets have also proved useful when adapted for pressure by wrapping of the rubber-glass junction with adhesive tape (fig. 1). The most satisfactory recipient apparatus is the special pressure set with double filters and outflows, which is more efficient, convenient, and safe.

The pressure pump consists of a hand bulb from a sphygmomanometer connected through a "Y" metal adapter to the air inlet of the blood bottle and to the manometer. It is necessary that the system be free of leaks. In order to assure freedom from leaks, the needle used for the air inlet should be not larger than 20 gage and should be inserted only once. The hand bulb must be in good condition, and it has been found convenient to keep a special one just for this purpose.

In order to assure sterility an 18 in. (46 cm.) length of sterile expendable plastic tubing[5] is interposed between the pressure pump and the blood bottle. This tubing has a male Luer adaptor at one end and a female Luer adaptor at the other end. The female end is capped with a plastic cylinder containing a small cotton plug. This plug, when pushed into the female Luer adaptor with a sterile needle before the cap is removed, serves as an efficient air filter. The sterile air filter eliminates the necessity of sterilizing the pressure pump, and its effectiveness in preventing contamination of the solution has been verified by rigid bacteriological testing.

The arterial cannula[6] consists of a 15 gage spinal needle cut off to 1¼ in. (3 cm.) and having a blunt end (fig. 2). The stylet is sharpened to a pencil type point and protrudes slightly beyond the end of the cannula to facilitate the arterial puncture. Identical cannulas in 18 gage are kept available for use in children. Ordinary 15 gage needles may be used in the absence of these cannulas, but the cutting edge produces a larger defect in the artery and bleeding continues longer after withdrawal.

When a 500 cc. flask of blood is nearly empty, a hemostat may be applied to the tubing or the stopcock turned to the off position while a second unit is being placed in the system. Two flasks of blood may be placed in series so that when one is empty the other may be started immediately without interruption of the administration. Newer disposable transfusion sets for pressure administration as previously noted are available which allow two flasks of blood to be quickly set up in series.

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[1] Halsted, W. S.: Collected Surgical Papers, Baltimore, Johns Hopkins Press, 1924. Originally published in New York J. Med **38**: 625, 1883.

[2] Kohlstaedt, K. G., and Page, I. H.: Hemorrhagic Hypotension and Its Treatment by Intra-Arterial and Intravenous Infusion of Blood, Arch. Surg. **47**: 178, 1943.

[3] Hale, D. E.: Arterial Infusion, Cleveland Clin. Quart. **16**: 216, 1949. Jones, P. G.; Davis, J. H.; Hubay, C. A., and Holden, W. D.: Physiologic Mechanism of Intra-Arterial Transfusion, Surgery **27**: 189, 1950. Robertson, R. L.; Trincher, I. H., and Dennis, E. W.: Intra-Arterial Transfusion; Experimental and Clinical Considerations, Surg., Gynec. & Obst. **87**: 695, 1948. Seely, S. F.: Intra-Arterial Blood Transfusion, Am. J. Surg. **78**: 733, 1949.

[4] (*a*) Ciliberti, B. J., and Dickler, D. J.: Intra-Arterial Transfusions in Hemorrhagic Emergencies, J. A. M. A. **144**: 382 (Sept. 30) 1950. (*b*) Porter, M. R.; Saunders, E. K., and Lockwood, S. S.: The Factor of Rate of Transfusion with Particular Reference to the Intra-Arterial Route, Ann. Surg. **128**: 865, 1948. (*c*) Ziccardi, A. V., and Madden, J. L.: Apparatus for Intra-Arterial Transfusion, Am. J. Surg. **81**: 470, 1951.

[5] Marketed by Abbott Laboratories, North Chicago, Ill., under the name of venotube.®

[6] Available through Cochrane Physicians Supplies, Inc., 133 E. 58th St., New York.

TECHNIQUE

After surgical preparation and draping of the wrist, a 1 in. (2.5 cm.) longitudinal incision is made over the area of palpable pulsation of the radial artery. The artery is exposed by blunt dissection, freed all around, and elevated over a small curved Kelly clamp. The artery is not incised but is entered directly with the cannula in a centripetal direction; the hub of the cannula is tied in place by means of a loose skin suture. One per cent procaine should be infiltrated around the artery prior to introducing the cannula in order to minimize spasm and thus facilitate the actual puncture. After the blood tubing and transfusion system is filled with blood, the tubing is clamped near the arterial end and pressure increased in the closed system to approximate 100 mm. Hg. The blood tubing is then connected to the cannula through a three-way stopcock. The blood bottle is hung at the same level as the patient's heart, and, when the clamp is removed, blood will flow until the pressure in the bottle balances the patient's mean arterial pressure. At this pressure, which can be read on the manometer, a drop of blood will hang in the drip indicator, pulsating with the heart beat. These pulsations are evidence that the system is functioning properly. Coarse fluctuations due to respiratory variations in blood pressure can also usually be seen.

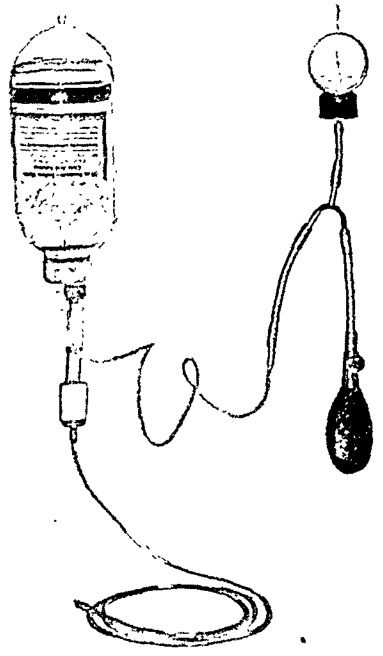

Fig. 1.—Apparatus assembled for intra-arterial use. The ordinary transfusion set is shown, and attached to the air vent is the Y adapter, manometer, and hand bulb.

If a system does not transmit pressure freely, it may be due to arterial spasm, which can be eliminated by procaine (1% or 2%) injected into the stopcock or by stellate ganglion blocks. Blood clots forming in the cannula can usually be aspirated with a syringe attached to the stopcock. If fairly high flow rates of blood are maintained, it is probably wise to cut the flow down to a very slow drip every half-hour and allow the arm to be perfused with oxygenated blood for a few minutes. It is seldom necessary to maintain high flow rates for more than a few minutes, however, which would, in fact, entail the infusion of massive amounts of blood. Approximately 12 pt. (5.7 L.) of blood can be infused in 30 minutes if necessary. It has been found more advantageous to maintain the flow rate at a slow drip, increasing the speed of infusion only to attain a physiologically adequate mean pressure. It is possible to regulate the flow with great precision, and rates of as little as four or five drops per minute are easily maintained.

When it is desired to stop the infusion, the cannula is simply removed and pressure kept on the artery until the bleeding stops. Bleeding may be extremely brisk on removal of the cannula, but will stop in four or five minutes. The pressure should be just sufficient to control the bleeding and still allow blood to flow through the artery. Ligation of the artery has been unnecessary. The artery should be treated as veins are treated after ordinary venipuncture. Following this technique, all of our patients have had good radial artery pulsations and no vascular complications have been encountered.

COMMENT

Eighteen intra-arterial infusions have been performed to date. Gelatin solutions have been administered on three occasions and plasma on one occasion by this route. The patients have ranged from 9 to 63 years of age, and the procedure has been done both as an emergency and as a prophylactic measure. The infusion has been maintained for as long as five hours, and the response of all patients to intra-arterial transfusion has been gratifying. It is apparently possible to maintain patients in excellent condition during long and shocking procedures with less blood than when the intravenous route is used. Severe blood loss, when it occurs, can be promptly and adequately replaced.

Evidence of deficient circulation of the arm or hand has not been seen. The technique herein described entails very little danger to the patient. There is no reason to believe that the use of blood substitutes should cause gangrene of the fingers and hand or skin sloughs of the forearm as has been reported. It is true that, when high infusion rates into the radial artery are used, in a centripetal direction, the entire supply of oxygenated blood to that extremity may be stopped as efficiently as by a tourniquet. These tissues, however, can survive periods in excess of one hour during which the circulation is completely occluded by a tourniquet, and as pointed out earlier there is no necessity for using high flow rates for this long a period of time. Such circulatory disturbances must be due rather to direct injury of the artery or reflex spasm of the artery.

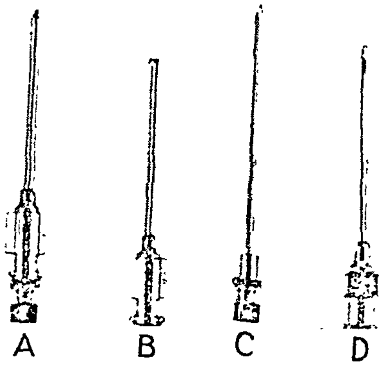

Fig. 2.—Cannula used for intra-arterial transfusion. *A*, the complete cannula (15 gage). *B*, the needle barrel, showing flat end. *C*, the stylet, showing the pencil type or conical point. *D*, ordinary 15 gage beveled needle.

To obviate the danger of direct injury of the artery, pressures are limited to 300 mm. Hg, and procaine is injected intra-arterially to prevent arterial spasm. Procaine solution (1% or 2%) in the amount of 5 to 10 cc. is injected into the side arm of the three-way stopcock and flushed into the artery by a very slow flow of blood in order to obtain prolonged contact of the procaine with the artery. This is repeated as often as necessary in anesthetized patients; the usual interval between injections is 30 minutes. The use of intra-arterial procaine in unanesthetized patients is not recommended, but stellate ganglion blocks are indicated. In any circumstance arterial spasm must be adequately treated. Such spasm may be retrograde as far as the axillary artery and sufficient to completely occlude the blood flow to the hand. This situation in the present series could not always be overcome by local infiltration of procaine around the artery but could be completely overcome by the intra-arterial administration of procaine. After the infusion has been started, it is desirable to undrape the hand so as to permit continuous observation of the fingers. The hand on the side of the infusion is invariably of better color and temperature than the other hand if sufficient procaine is infiltrated intra-arterially.

In one case it was necessary to transect the radical artery in order to enter the lumen. The combination of spasm and shock was so severe in this patient that no blood could be aspirated from the cannula after its introduction. After 15 cc. of 2% procaine had been forced up the artery, it began to bleed sluggishly, and, after about 700 cc. of blood had been given, the mean arterial pressure had reached 100 mm. Hg. At this time the artery pumped vigorously from the distal cut end and the clamp had to be reapplied to include a rent in the artery that had *not* bled during the hypotensive period. This patient had excellent circulation in her hand postoperatively. This method of entering the artery is rarely necessary, but it is certainly justified as a lifesaving measure and should cause no difficulty unless the patient has an absent ulnar artery or anomaly of the volar arch.

SUMMARY

A technique for intra-arterial infusion is described. Emphasis is placed on simplicity, efficiency, and safety. The role of vasospasm in the production of gangrene is discussed and measures for its prevention outlined. Postarterial puncture treatment consists in the application of pressure only. It is hoped that simplification of apparatus and technique will make for more widespread use of this valuable therapeutic measure. It is further hoped that realization of the advantages and of the freedom from serious sequelae will foster the use of this technique as a prophylactic measure in selected surgical cases.

SOME FUNDAMENTALS OF POSTGRADUATE EDUCATION FOR THE PHYSICIAN

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The purpose of postgraduate, or continuation, education is to keep the practicing general physician or specialist up-to-date. Its aim should be to stimulate the physician to such an extent that he continues to be a student of medicine throughout his professional life. Postgraduate education should not be confused with graduate education or residency training, through which a physician is trained to become a specialist in a given field of medical practice.

The rapid progress in all branches of medical science makes it essential that both general physicians and specialists constantly strive to keep informed about new medical knowledge and techniques. When one considers how quickly a physician's knowledge becomes outdated, one is impressed with the importance of this phase of medical education. It is encouraging, and yet frightening, to realize the amount of new information and the many changing ideas that can be brought forward in such a short period of time as five years. If we consider every practicing physician a potential postgraduate student, we begin to realize the magnitude of the possibilities in this field of medical education.

The physician who is a true medical student conducts the major portion of his program of continuing education in his active daily practice. He does this through the careful study of every patient under his charge. By frequent reference to monographs, reference textbooks, and current medical journals, he attempts to keep abreast of new information and to increase his store of fundamental knowledge concerning human beings in health and disease. Consultations about his patients with professional colleagues afford an excellent patient-centered instructional opportunity. Educational activities of the hospital's medical staff, such as x-ray and pathological conferences, departmental and staff meetings, may serve as a source of stimulation and information. Professional society meetings also add to the opportunities for continuation education open to the interested physician. Despite these opportunities, most physicians are confronted with the fact that each succeeding year their personal program of study becomes more inadequate. The young physician opening practice may find that he has ample opportunity, during the initial phase of his practice, to conduct an extensive program of study by utilizing many of the features mentioned above. As his practice grows, however, he finds that it becomes increasingly difficult to find time for the amount of studying that he feels he should do. The demands of his patients have priority over an evening with his medical journals or books.

Many different groups are now attempting to help the practicing physician meet his educational needs. Medical schools, hospitals, county, state, and national medical societies, foundations, and voluntary and governmental agencies are actively engaged in this field. Programs of widely different patterns, with somewhat different objectives, have been offered to physicians in all sections of the United States. A great deal of time, energy, and money is being expended. The effectiveness of these measures is difficult to measure at the present time.

An effective program of continuation education for physicians must be aimed at meeting the needs of the

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Read before the Forty-Eighth Annual Congress on Medical Education and Licensure, Chicago, Feb. 11, 1952.

physicians. Some programs have failed because this fundamental idea has been overlooked. All too often, programs for general physicians have been planned by medical specialists and administrators who have little or no knowledge of the problems that confront the general physician daily. Such programs cannot hope to achieve maximum effectiveness. Frank discussions in hospital staff and county society meetings will often give invaluable aid in bringing out those areas of medical practice that most trouble the general physician. Properly organized questionnaires may afford a sampling of a large group of physicians, with a minimum of time and expense being required. Such inquiries will usually reveal that the practicing physician is most anxious to learn those things that will help him in the diagnosis and management of the common medical and surgical problems.

It is obvious that physicians' needs vary, depending on their initial training, conditions of medical practice, availability of consultants, and many other factors. A general physician in a large metropolitan center may refer all fractures and soft tissue injuries to a specialist. A physician practicing alone in a relatively isolated rural community may frequently be required to handle such problems. Fractures and traumatic surgery will be a matter of great interest to him. It is possible to consider the needs of physicians in two main groups; first, there is a need for information; second, there is a need for understanding and using new methods of diagnosis and treatment.

The needs of most practicing physicians are chiefly concerned with new information. In the busy practice of medicine, a host of questions are constantly arising. Is there a new and more effective antibiotic agent for brucellosis? Is there a better method for administering a certain new agent? How long should penicillin therapy be continued in the treatment of subacute bacterial endocarditis? What are the contraindications and side-effects of hormonal therapy? Questions of this sort are constantly plaguing the practicing physician. Unfortunately, he often has neither the time nor the library facilities to find the answers to these questions.

Learning to perform or to utilize new techniques or methods is another need that often confronts the practicing physician. He may wish to learn to interpret electrocardiograms, or the skilled use of local anesthetics in his obstetric practice may be his goal. The methods to be used in a program of continuation education for physicians should depend on the objectives in view. If the purpose is to transmit information, this can be effectively done by means of lectures. In recent years, there has been a tendency to underestimate the value of this method of learning; however, a stimulating lecturer, who makes full use of available audiovisual aids, still has a great contribution to make in this type of program. Lectures should not be prolonged. If one lecturer is to discuss an extensive subject, the period should be broken up by rest periods, during which questions or discussion may be encouraged. The use of panels of speakers to cover a broad subject will often serve to maintain interest at a higher level. We must remember that the time span of attention of physicians who have been away from the medical school atmosphere for years is considerably shorter than that of undergraduate medical students. If properly used, lectures will be a source of great stimulation and will offer a fund of valuable information.

Experience has taught us that courses should not be scheduled too rigidly, for, if we fall behind schedule, we find that students give too much attention to the schedule and not enough attention to the speaker. Ample time should be left for questions and discussion, and time should be provided for frequent, though brief, rest periods. The period after lunch is worthy of special consideration because of the wave of somnolence that so often prevails. We often ask our speakers to halt their lectures at intervals and give the class a 30 second period to stand and stretch.

The type of teaching program to be used in instructing physicians in the use of methods and techniques of diagnosis and treatment will usually require a different approach than the lecture method. For this type of teaching, small group instruction, either in the laboratory or at the bedside, may be required. Teaching in our outpatient clinic is an important part of this type of instruction. Continuation postgraduate courses may be further classified as to those that are given at the teaching center, such as the campus of the medical school or the teaching hospital, and those that are given in cities and towns at some distance from the parent hospital or medical school. Courses given at the medical center may further be subdivided into full-time courses and part-time courses.

The full-time courses require that the physician leave his practice during the period of the course and devote his entire time to his postgraduate studies. These courses may vary in duration from one or two days to several weeks or even months. It was the experience at the University of Minnesota that physicians preferred to come to the center for continuation study for courses of two or three days' duration. They apparently found it difficult to leave their practices for periods of one or two weeks. A physician practicing without associates must make arrangements with his colleagues to take over his practice while he is attending the course. It is easier to persuade a colleague to carry an extra load for a few days than for several weeks. The physicians indicated that they preferred to take three or four two-day or three-day continuation courses at intervals throughout the year than to take a single two-week course. The physicians also indicated that, even though a program carrying the educational opportunities out into the state was offered, they did not wish this to curtail the program that was offered at the medical center. Medical center courses afford the physician a brief respite from the responsibilities and cares of his practice and an opportunity to get back into the stimulating atmosphere of a teaching hospital and to confer informally with men in a wide variety of specialties.

Part-time courses may be given at the medical center or at regional centers. Such courses may meet for one or two hours or longer, once a week, for one or two months, or for an entire semester or school year. These courses require that the physician live in the city in which the course is given or within commuting distance of that city. The content of such courses depends on obtaining qualified teachers and the interests of the physicians for whom the courses are intended. Part-time courses offer certain advantages. The physicians are kept in touch with the teaching program over an extended period of time; thus, certain types of material may be presented in smaller segments, and the physician may be given an opportunity to think through, digest, and apply the material of each session in the week that follows. In such subjects as electrocardiography and roentgenogram interpretations, more can be accomplished in 10 two-hour sessions given over a period of two and one-half months than in the same number of hours given over a period of two and one-half or three days.

For many years, various methods have been used to bring teachers from medical centers into contact with physicians practicing in peripheral regions. Some of these efforts have been built around "circuit riding" lecturers from the medical center, who traveled for a single day or for one or more weeks, stopping at different communities, giving lectures, holding clinics, and attending ward rounds with physicians in the community. The exact mechanisms used in such programs depend on the number of physicians in the community and surrounding area, the type of hospital facilities, and the objectives of the program. If the dissemination of information is the purpose of such a meeting, this can be accomplished by lectures and clinic presentations; on the other hand, techniques can be taught only at the bedside, in the laboratory, or in the examining room of the clinic. One advantage of such regional programs is that they carry information from a metropolitan area, in which there is, too often, an excess of medical meetings, and bring it to the rural communities where there is often a dearth of scientific assemblies. The disadvantage of the circuit riding program is that it often wastes the time of the teaching staff. Much of the time spent away from the parent institution may be nonproductive, in that it is spent in traveling to and from the peripheral teaching center.

Many regional internship and residency programs have been organized, expanding the opportunities for training house officers and providing a program of continuation education for the medical staff of the hospitals. In many such programs, medical faculty members of professorial status come to the peripheral hospitals for one day at regular intervals. On such occasions, they confer with the interns and residents, review their work, make ward rounds with the residents, which the staff of the hospital are invited to attend, and hold teaching clinics and conferences for the residents and other staff members. In these programs, such as the decentralized residency program at the University of Michigan, the resident from the local hospital may come to the medical school for one year at the midportion of his period of training. When he returns to the local hospital after this period at the medical school, it is hoped that he will be a source of greater stimulation in the local hospital. One danger must be constantly avoided in such decentralized programs of internship and residency training; the intern and the resident must not be exploited in order to provide a program of postgraduate education for the hospital's medical staff. The hospitals and the medical center have a primary obligation to the intern and the resident to see that their term of service is a well-planned teaching experience from which they will profit to the greatest possible degree.

Better methods of communication have already made possible other methods of bringing continuation education to the physician who lives outside of immediate contact with the medical center. Through leased wire broadcasts, one outstanding teacher may reach county society members throughout a wide geographic area. Arrangements can easily be made to have duplicate sets of lantern slides or other visual education materials available at each subsidiary center where the lecture is being broadcast. Two-way communication may even make it possible to have a question and answer period between the physician-student groups and the teacher at the broadcasting studio. Broadcasts in which an outstanding teacher of national or international fame speaks to audiences scattered over the entire United States are an exciting possibility for the near future. The development of television, particularly with color, may soon modify many of our present methods of continuation education. Circuit riding lecture courses may soon become a thing of the past. Technical devices that will limit the television audience to the physician of a community may soon make it possible to bring lectures, clinics, and demonstrations into the physician's home during an evening hour. It is impossible to estimate the impact that this may have on methods now being utilized in this field.

No set pattern can be created that will be equally well adapted to the program of postgraduate medical education in all sections of the United States; even the actual administration of such a program will vary from one place to another. In many areas, medical schools recognized early their responsibility in conducting a program of postgraduate education for physicians. In other regions, professional societies became active and organized and conducted an effective program. Lack of facilities at the teaching hospitals may make it necessary, in some centers, to hold the programs in hotels or other buildings. Climatic characteristics, road conditions, and availability of other methods of transportation will influence the type of program that can be presented.

Postgraduate medical education presents a challenge to medical educators and the entire profession. This challenge will be met only when all physicians have become life-long students of medicine.

Prevention of Addiction.—What can be done to prevent addiction from the therapeutic use of drugs? The recognition of the personality type which is susceptible to addiction is, obviously, very important. It is also very hard to do, but if the history indicates alcoholism or previous addiction to a drug, it should alert the doctor to the danger of addiction to all analgesic drugs. The physician must be quick to recognize the development of tolerance to drugs he prescribes. As soon as the dose of an analgesic drug has to be increased, one should suspect that tolerance is developing, and possibly physical and psychologic dependence as well. One should be especially careful in the treatment of diseases that are going to require drugs over a long period of time. I am thinking especially of the use of morphine or morphine derivatives in the treatment of chronic cough or diarrhea or for the pain of rheumatism, arthritis, or other chronic conditions. Barbiturates are sometimes used regularly over long periods of time in the treatment of hypertension and insomnia, and here too, the danger of addiction is real.—Walter Modell, M.D., Addiction as a Complication of the Therapeutic Use of Drugs, *New York State Journal of Medicine*, March 15, 1952.

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BASIC PRINCIPLES IN THE SURGICAL TREATMENT OF DUODENAL ULCERS

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Almost 30 years have elapsed since the late Dr. A. A. Berg [1] and I [2] became convinced that in our hands gastroenterostomy was a complete failure in many cases of duodenal ulcer. At that time we advocated, for the first time in this country, that the operation of partial gastrectomy be employed in its stead as the surgical procedure of choice for duodenal ulcer. This decision was based largely upon the work of Haberer.[3]

Haberer's technique consisted in removing a distal one-half to two-thirds of the stomach together with the pylorus and the ulcerative lesion in the duodenum. This procedure apparently appeared unnecessarily radical to many surgeons. For this reason a great deal of antagonism was encountered when the method was first introduced. At a meeting of the American Medical Association in Washington [4] in 1927, where I presented results with partial gastrectomy as compared with results with gastroenterostomy, a leading surgeon stated in the discussion, "If any man wanted to cut out half of my good stomach in order to cure a little ulcer in my duodenum, I would run faster than he." After about 15 years of uphill work, and after encountering opposition that varied from severe criticism to polite amusement, this method gradually came to be accepted as the operation of choice for duodenal ulcer.

An intermediate step between gastroenterostomy and Haberer's method of gastric resection is represented by Finsterer's[5] so-called *Resektion zur Ausschaltung*. In this technique the dissection was not carried distal to the duodenal ulcer, but left the ulcer, the pylorus, and a small part of the antrum in situ. The distal part of the antrum was left solely in order to guarantee a safe closure of the duodenal stump, as the pylorus, a muscular organ, could not be used for that purpose.

Finsterer was aware of the great importance of the antral mucosa in the development of recurrent ulcer, especially gastrojejunal ulcer. For that reason he advocated the excision of the mucous membrane portion of the gastric stump by blunt dissection. Apparently the details of Finsterer's paper were not known to Bancroft [6] and Plenk,[7] who introduced similar methods in 1932 and 1936, respectively. Finsterer stated: "If the ulcer is of such size that it reaches from the pylorus to the papilla, the stomach must be transected close to the pylorus on the gastric side; the small distal stump of the stomach is closed after its mucous membrane has been excised as completely as possible." However, even with all these precautions secondary ulcers frequently appeared.

I have quoted from Finsterer's paper verbatim because he states clearly in this paper that this method should be used only in very large ulcers, those that reach from the pylorus to the papilla. However, this type of ulcer is very rare. In this relatively small group of cases it seems probable that a simple gastroenterostomy would be preferable to the major procedure advocated by Finsterer.

It should be emphasized that the excision of the mucosa of the antrum in its entirety is not an easy technical procedure, especially since severe gastritis is frequently encountered in the antral mucosa. The separation of the mucosa from the underlying muscularis may result in considerable oozing. Furthermore, the remaining shell of muscularis and serosa may be so thin that spontaneous perforations in this prepyloric pocket are likely to occur. This complication, which is often called a "blow-out," and erroneously attributed to back pressure in the duodenum, is probably due to local necrosis in the badly nourished tissue of the antral stump. If technical difficulties result in the retention of portions of the antral mucosa, its hormonal influence persists.

When, after many years of discussion, surgeons had become convinced that gastroenterostomy should be supplanted in most instances by a more radical procedure, and still were not willing to attack the ulcer directly, the Finsterer operation enjoyed short-lived favor. In some quarters the term "physiological gastrectomy" was employed to describe it. This has always appeared to me to be a badly conceived title. "Nonphysiological gastrectomy" would have been a better description, since secondary ulcers at or near the anastomosis often followed its employment.

For instance, the well-known British surgeon Sir Heneage Ogilvie [8] stated:

> When I published my second paper in the Edinburgh Medical Journal in 1936, I had had no reason in two years' trial to be anything but satisfied with the results of this procedure. Since then 9 out of 22 patients in whom "physiological gastrectomy" had been performed more than two years ago have been found on follow-up to have pain; 3 lost their symptoms after medical treatment, but 6 had definite jejunal ulcers requiring further operation. Of these 6 jejunal ulcers, 3 were in a series of 12 gastrectomies for duodenal ulcer, and 3 were among 10 patients previously operated on for jejunal ulcer following gastrojejunostomy. These unfortunate results are in marked contrast to about 100 gastrectomies in which the duodenum was divided, some of them under observation for 12 years, among whom no cases of recurrent ulceration, or indeed of more than minor discomfort, have been met.

The typical Finsterer operation is nowadays used so rarely that detailed discussion would appear to be unnecessary. However, the method is often used inadvertently in a modified form by surgeons who prefer to leave the ulcerative lesion in the duodenum in situ. As regards the actual removal of the duodenal ulcer, there are at present two schools of thought. The first, representing the vast majority, prefers to remove the ulcer in the course of the gastrectomy. The second, constituting a smaller group, does not attempt to remove the ulcer except in those cases in which the presence of a freely mobile duodenum makes the dissection simple. The latter group claims that removal of the duodenal ulcer is unnecessarily radical. As a matter of fact, most duodenal ulcers are located in the first part of the duodenum, their proximal margin extending right up to the pylorus. The ulcer is usually surrounded by inflammatory tissue, which would make a safe closure just distal to the pylorus impossible. In order to insure an adequate duodenal closure, the line of transection would have to be carried proximally into the antrum. This is in fact a modified Finsterer procedure, with its ensuing risks of secondary ulcers at or near the gastrojejunal anastomosis. It should be emphasized that in only a few cases is the duodenal ulcer located so far distal to the pylorus that enough duodenum to effect a safe closure remains proximal to it.

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[8] Ogilvie, W. H.: Physiology and the Surgeon, Edinburgh M. J. **43**: 61, 1936; Approach to Gastric Surgery, Lancet **2**: 295, 1938.

After all, the safe closure of a duodenal stump is the *sine qua non* for a safe postoperative course. In the vast majority of cases this objective can be attained only by carrying the dissection distal to the ulcer and into a normal duodenum. Only in those rare cases in which the ulcer involves the common duct should such a dissection be hazardous. Ulcers in this particular location represent not more than about 5% of the cases. In other words, the actual excision of the duodenal ulcer in the course of a gastrectomy is usually an operation of necessity and not, as some surgeons seem to think, the operation of choice.

When such an ulcer is left in situ, the operation should be clearly labeled a "palliative resection." Otherwise recurrent symptoms may be erroneously attributed to the radical operation for duodenal ulcer, when, as a matter of fact, a modification of it is really used.

In the surgical treatment of gastric ulcer, conditions may occasionally exist that contraindicate the removal of the ulcer, though some surgeons, for instance Aird,[9] claim that any gastric ulcer is removable. However, when gastric ulcers are located very close to the cardia, the surgeon may be forced to leave the ulcer in situ and proceed with the gastric resection distal to the ulcer. This form of resection is never classified as subtotal gastrectomy, but always labeled a palliative resection for gastric ulcer, or a Madlener [10] operation. In this manner not the slightest doubt can exist that the ulcer was not attacked directly and thus may cause trouble (for instance, malignant degeneration) at a later date. It is a moot question whether the disappearance of a gastric ulcer following a Madlener operation is not simply due to a temporary, spontaneous disappearance of the ulcer (so-called life cycle).[11]

In the same manner, an operation for duodenal ulcer that does not remove the ulcer must be classified as a palliative resection, for a lax definition of an operative technique makes a correct evaluation of a statistical material impossible. Occasionally, in spite of the most careful palpation by an expert surgeon, no ulcer will be found. In these cases the diagnosis must be labeled an error, and these should not be described as cases of ulcer; otherwise statistics will lose their value.

X-ray findings alone cannot be the deciding factor with respect to gastric resection. X-rays may lead to error just the same as any other diagnostic method. In the absence of any objective visual or palpatory findings of ulcer at the operating table, a major resection should not be proceeded with simply because the roentgenologist has made a positive diagnosis of duodenal ulcer.

It must be understood that the specimen cannot and does not present a picture of the ulcer in its entirety in every case. For instance, if the Nissen [12] technique is used, only a part of the ulcer would be found on the specimen. However, if the pathologist reports that he could not find even a small part of an ulcer or definite evidence of a healed ulcer on the specimen, it must be assumed that either a typical or atypical Finsterer operation was performed or that the stomach was resected in the absence of a duodenal ulcer. However, one may encounter the occasional case, cited above, in which the upper margin of the ulcer is located at a point in the duodenum sufficiently distant from the pylorus to permit a closure in normal proximal duodenum.

VAGOTOMY

The impetus for the revival of vagotomy was given by Dragstedt,[13] who, in 1943, after performing careful animal experiments, suggested transthoracic vagotomy. In 1945 he replaced the transthoracic approach by the transabdominal,[14] for two reasons: (1) the importance of inspection of stomach and duodenum in order to prevent unnecessary surgery and (2) the great frequency of postoperative gastric stasis, which made coincident drainage operation, in the form of gastroenterostomy, imperative in the majority of cases. However, even after the performance of a gastroenterostomy, stasis in the small intestine was most annoying in many cases.

Nobody will deny that the removal of a duodenal ulcer is not always an easy procedure, certainly not for surgeons with only limited experience in gastric surgery. Unquestionably duodenal ulcers appearing easily resectable to one surgeon may be considered nonresectable by another, who will tend to welcome any new suggestion, such as supplemental employment of vagotomy, that might justify the use of gastroenterostomy instead of gastric resection. However, because of the increased experience acquired in many clinics, the initial enthusiasm for vagotomy has already subsided considerably.

It is too soon to say whether gastroenterostomy plus vagotomy will give better final results than simple gastroenterostomy. It must again be stressed that gastrojejunal ulcers have appeared at periods as late as 10 to 20 years after operation. A similar attitude must be adopted in regard to the practice of supplementing partial gastrectomy with vagotomy. I still believe, as I stated in 1948 at a meeting of the American Medical Association, that surgeons will eventually find that vagotomy is indicated only in a small group of cases, i. e., those in which recurrent anastomotic ulcers follow adequate subtotal gastrectomy.

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CONCLUSIONS

1. Gastric resection for duodenal ulcer should include the removal of the ulcer in about 90% to 95% of the cases. This operation guarantees a much safer closure of the duodenum than the palliative operation devised by Finsterer.
2. The Madlener and Finsterer palliative operations should be used only in those very rare cases in which the location or size of the ulcer makes removal impossible.
3. In nonresectable duodenal ulcers simple gastroenterostomy, possibly supplemented by vagotomy, is preferable to Finsterer's so-called *Resektion zur Ausschaltung.*
4. Gastrojejunal and jejunal ulcers are observed much more frequently in cases in which the ulcer was left in situ than in those in which it was removed at the time of operation. For this reason gastric resections without removal of the duodenal ulcer should be clearly defined as palliative operations. An inaccurate definition of the operative technique makes a correct statistical evaluation of the surgical material impossible.
5. The role of vagotomy in the treatment of duodenal ulcers remains in doubt.

20 E. 16th St. (21).

URINARY RETENTION IN PREGNANCY

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In view of the large accumulation of literature concerning the upper part of the urinary tract during pregnancy, the little attention paid to the bladder under the same conditions seems remarkable. It is well known at about the fourth month of pregnancy ureteral dilatation begins, a condition of atonia that expresses itself as a relaxation of the smooth musculature of the ureters.[1] This dilatation is demonstrable by pyelography and includes the renal pelves. It is probably caused by the increased elaboration of progesterone at the beginning of the second trimester as the placenta takes over the functions of the corpus luteum.

At this time the bladder undergoes changes in keeping with those in the upper part of the urinary tract. With the hyperemia affecting all the pelvic organs, plus a definite hyperplasia of muscular and connective tissue elements, there is an elevation of the trigone and a thickening of its posterior or interureteric margin.[1] Langworthy and Brack[2] have shown that, in addition to the trigonal hypertrophy, progesterone is responsible for an increase in capacity and decreased tonicity of the rabbit bladder in pregnancy. Muellner[3] showed by cystometric studies that the human bladder also exhibits a gestational increased capacity and decreased tonicity, beginning in the third month.

These physiological changes in the bladder in pregnancy, coupled often with the mechanical pressure of the cervix of a retroverted uterus on the urethra and bladder neck are responsible for the fairly frequent occurrence of acute urinary retention during pregnancy. Although many obstetricians have seen such acute retention in their private practice, a search of the literature revealed a surprising dearth of material on the subject. We feel that prompt recognition of the syndrome is important, since the patient is seen by the physician when she is in acute distress, often with the abdominal rigidity and rebound tenderness that the inexperienced practitioner might erroneously regard as the abdomen of an acute condition requiring surgery.

Matthias Saxtorph[4] of Copenhagen, in 1775 reported a case in which a retroverted pregnant uterus caused complete urinary retention and death as the result of a ruptured bladder. Burdon and co-workers[5] reported a case of acute urinary retention in a primigravida, four months pregnant, caused by an incarcerated retroverted uterus. With the expanding uterus wedged below the sacral promontory, the cervix acted as a pressure point to effect urethral occlusion. Cystoscopy revealed edema of the internal orifice, possibly a contributory factor in the retention. Although Burdon and his associates were able to find only two other such cases in the available literature, we believe it occurs often enough to comprise a syndrome with which one should be familiar.

The following cases illustrate the acute onset of the retention and its usually rapid disappearance when proper therapy is instituted.

REPORT OF CASES

CASE 1.[6]—Mrs. R. H., a 32-year-old primigravida had an uneventful early pregnancy until the end of the fourth month, when acute, complete urinary retention suddenly developed. She was hospitalized, and examination revealed a pregnant uterus in normal position, with the bladder distended and very tender and the patient in acute distress. Catheterization obtained 1,000 cc. of clear urine, with complete relief. Further exploration disclosed no abnormalities, and bladder function spontaneously returned to normal and remained so for the duration of the pregnancy.

CASE 2.—Mrs. M. C., a 37-year-old woman, gravida 4, para 3, was seen by us early in the fourth month of pregnancy as an

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[6] Buxbaum, H.: Personal communication to the authors.

emergency, with severe abdominal pain. The uterus was normal in position and the bladder tremendously distended. Catheterization yielded 1,200 cc. of clear urine, with prompt relief. The patient continued to have mild dysuria for the next two weeks, which was decidedly relieved by oral therapy with neostigmine (prostigmin®) bromide. This patient had exactly the same type of acute retention with her next pregnancy, at the same stage of gestation, and was treated successfully in the same manner. Urological examination disclosed no abnormalities.

Case 3.—Mrs. R. L., a 31-year-old woman, gravida 2, para 1, was admitted to an outlying hospital in the 15th week of pregnancy with severe abdominal pain and anuria. Catheterization yielded 1,100 cc. of urine. Cystoscopy was accomplished with difficulty and only by pronounced depression of the ocular end of the cystoscope. It revealed a greatly elevated trigone and an extravesical depression at the dome of the bladder. The patient was seen in consultation by Dr. Ralph A. Reis,[7] who found the acute urinary retention to be caused by an incarcerated retroverted uterus. The inability to void persisted until the uterus was manually replaced in normal position under general anesthesia. The remainder of the pregnancy was uneventful.

Case 4.[8]—Mrs. A. R., a 24-year-old woman, gravida 2, para 1, experienced acute urinary retention in the third month of pregnancy, caused by an incarcerated retroverted uterus. She was seen in the office suffering extreme discomfort, which was relieved by catheterization. The uterus was manually replaced, and the patient had no further difficulty.

Case 5.[9]—Mrs. T. L., a 22-year-old primigravida, was admitted as an emergency patient in the latter part of the third month of pregnancy, complaining of severe lower midline pain and an inability to urinate. The uterus was in a normal erect position, but cystoscopy revealed a narrowing of the bladder neck, possibly caused by dextrorotation of the uterus. An indwelling catheter was left in the bladder for one week before function returned.

In addition to the above cases, there were two cases in the private practice of Dr. J. P. Greenhill,[10] two in the practice of Dr. W. H. Rubovits,[11] and three in the practice of Dr. A. K. Koff [12] that were very similar to case 4, in that the condition in all seven was caused by an incarcerated retroverted uterus; the same treatment was used in each case.

COMMENT

None of these patients had any history of urinary symptoms prior to pregnancy. In each case the retention originated in the bladder, with the upper part of the urinary tract playing no role. In each case, therefore, we may conclude that the bladder may be profoundly influenced in early pregnancy, whether by intrinsic trigonal hypertrophy and decreased tonicity (as in cases 1, 2, and 5) or by direct pressure by the cervix of an incarcerated retroverted uterus on the urethra and bladder neck (as in cases 3 and 4).

One may elicit a history from these patients of an inability to urinate, but frequently they complain only of pain so severe that no mention is made of any urinary urge. The diagnosis is made by physical examination and catheterization. Abdominal examination reveals the bladder as a distinct rounded, tender mass, extending a variable distance between the symphysis and the umbilicus, flat to percussion, soft, and productive of a fluid wave. The uterus, if erect, can be palpated above this mass and is firm and nontender. Vaginal and rectovaginal examination are important. In cases of incarcerated retroverted uteri, the soft bladder mass is easily palpable abdominally; on rectovaginal examination the firm uterine fundus is felt, wedged in the cul-de-sac and pressing on the rectum, while the cervix is palpated high under the symphysis, pressing anteriorly on the bladder neck. Catheterization, important in any acute condition of the abdomen, will reveal a large quantity of urine, disappearance of the soft abdominal mass, and immediate relief of pain.

Since partial dextrorotation of the pregnant uterus is of common occurrence, it is possible that this twisting may be a contributory factor in these cases. Porcar and Baqués [13] reported a case of acute retention in a nonpregnant woman due to a twisted myomatous uterus.

In any discussion of urinary retention, the emotional factor must not be overlooked as a possible etiological agent. Cases of complete urinary retention caused by severe emotional stress have been reported.[14] It is equally possible that polyneuritis of pregnancy based on a thiamine deficiency may contribute toward bladder atony [15]; also, urethral obstruction by stricture, stone, urethral prolapse, or edema may produce retention.

SUMMARY

In general, acute urinary retention in early pregnancy, while not common, occurs frequently enough to be considered an important clinical entity. Any of the pathological conditions that may produce retention in the nonpregnant woman, i. e., obstructive lesions, stricture, stone, urethral prolapse, or edema, may do the same in pregnancy. However, the patient entering the second trimester of pregnancy often shows hypertrophy of the trigone, with increased bladder capacity and decreased tonicity, which may of itself cause failure of bladder function. Even more commonly, a growing incarcerated retroverted uterus may cause the anteriorly displaced cervix to occlude by pressure the urethra and bladder neck. Dextrorotation of the uterus, polyneuritis, and disturbed emotional states may be contributory factors.

It is of utmost importance that this condition is not mistaken for an acute condition requiring surgery, which it often resembles. Treatment is simply catheterization, replacement of the uterus if retroverted, and administration of bethanechol (urocholine®) chloride, neostigmine (prostigmin®) bromide, or pilocarpine.[16]

109 N. Wabash Ave.

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8. Dresner, M.: Personal communication to the authors.
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Interpretation of Roentgenograms.—The radiographs heed no specialty. He who takes the responsibility of interpreting them must have knowledge not only of his specialty but also of the radiology of all structures in the area, widely separated though they may be anatomically. A predominant interest in any one system may blind the observer to other evidence obvious to those who seek it. Even radiologists who are aware of the possibility, suffer in this way, and they come to recognize, with experience, shadows and appearances that they did not previously see.—James F. Brailsford, M.D., Factors Which Influence the Value of a Radiological Investigation, *Lancet*, April 5, 1952.

THE CERVICAL CAP

AN ADJUNCT IN THE TREATMENT OF MALE INFERTILITY

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With the recognition of the importance of the male factor in barren marriages, much of the energy of infertility studies during recent years has been correspondingly diverted toward overcoming this obstacle. Although the beneficial possibilities of tubular regeneration by prolonged testosterone therapy, as noted by Heller and co-workers,[1] is worthy of note, hormonal therapy in the infertile male, with the exception of desiccated thyroid, has in general proved futile in the attempt to produce a more potent semen. As a result, certain mechanical therapeutic measures have been adopted in an effort to afford the maximum possibility of fertilization in the presence of any semen deficiencies. Oligospermia has been the particular target of mechanical aid.

Two methods are used. Both employ the principle of semen concentration. The first involves removal of the spermatozoa from the semen by dilution with Locke's solution and a subsequent process of centrifugation and decantation. In this way the spermatozoa are concentrated within a 1 cc. volume. Insemination with this volume has been intravaginal, intracervical, or intrauterine, and in the most recent study [2] has been intracervical but associated with the use of an artificial cervical plug to prevent backflow. The second method, first described by Whitelaw,[3] concerns the use of a relatively tight-fitting plastic cervical cap. This cap acts as a means of concentrating the entire ejaculate in close approximation with the external cervical os, in an environment favorable to sperm survival. In the present study the cervical cap has been employed in every case.

SELECTION OF COUPLES

All couples included in this group had experienced a reasonable period of infertility. With reference to the qualifications required of a couple to be included in our over-all sterility studies, as noted in a forthcoming publication,[4] all couples in this particular group had experienced sincere unsuccessful trial at conception for at least one and one-half years. Subjection of both partners to an intensive diagnostic and therapeutic regimen over a two to four-month period invariably preceded selection and established the basis for inclusion in the series.

Accepting a sperm count of 60 million per cubic centimeter as the arbitrary lower limit of the normal range, the principal criterion for admission to this special group was oligospermia of less than this figure. Other apparent deficiencies of the semen, mainly decreased motility and longevity, and abnormal morphology, were factors in selection. In this series these deficiencies, when present, were associated with oligospermia in every case. Multiple semen analyses were performed, according to the tenets of Falk and Kaufman,[5] before a diagnosis of deficiency was made.

Not infrequently other inhibiting factors to fertility were uncovered in couples included in this series, chiefly decreased metabolic function in one or both partners or other endocrine disturbances in the female partner, as noted mainly by the basal metabolic rate, vaginal smear, and endometrial biopsy. These factors were corrected promptly, and a further brief trial period of two to four months ensued before any capping procedure was attempted.

The use of the cervical cap in this series has now been extended to include well-selected cases with no apparent abnormality of the semen and in which other obvious sterility factors have been eliminated. These couples had had at least one year of therapy by other physicians and treatment by us from 6 to 12 months without success before capping technic was suggested.

A few of the couples in the group had a previous history of conception with a subsequent protracted period of infertility. Deficient semen was involved in one-half of these cases.

METHODS

Ovulatory time is determined by the vaginal smear technic.[4] The ovulatory smear pattern of each patient is established before capping is ventured. On this basis, by means of smears taken every 12 hours during the presumptive ovulatory phase, ovulation may be predicted fairly accurately with each subsequent cycle during which capping is done. In the capping series, ovulatory time was presumed to be ascertained with a high degree of certainty in at least 90% of the patients. This high frequency of diagnosis of presumptive ovulation is considerably higher than in the usual group of sterile couples, in which female endocrine abnormalities are more often noted. Rectal basal temperature charts are kept by all patients in addition to the vaginal smears and are used merely as supplementary evidence of ovulation. In only three cases in the capping series did the temperature chart prove superior to the vaginal smear as a means of diagnosing the presumptive time of ovulation.

Insemination procedures with the plastic cervical cap are carried out twice during the ovulatory phase of each cycle at 36-hour intervals. Arbitrarily we have considered an optimal capping schedule as one in which the first cap application takes place within 12 hours prior to presumptive ovulation. Generally capping was done in the 24 hours just preceding ovulation. The second capping, despite the shortened period of abstinence, was done as an insurance measure in event the ovulatory time was missed.

In every case the first capping was preceded by a three- to five-day period of abstinence. The specimen is collected by masturbation directly into a clean, wide-mouthed glass tube. This is done usually about 15 to 20 minutes before capping actually takes place. At least 10 minutes is always allowed after collection for liquefaction to occur, to prevent loss of semen in the transfer from tube to cap.

From the Department of Obstetrics and Gynecology, Washington University School of Medicine.

1. Heller, C. G., and others: Improvement in Spermatogenesis Following Depression of the Human Testis with Testosterone, Fertil. & Steril. **1**:415-422 (Sept.) 1950.

2. Hanson, F. M., and Rock, J.: Artificial Insemination with Husband's Sperm, Fertil. & Steril. **2**:162-174 (March-April) 1951.

3. Whitelaw, M. J.: Use of the Cervical Cap to Increase Fertility in Cases of Oligospermia, Fertil. & Steril. **1**:33-39 (Jan.) 1950.

4. Grody, M. H.; Robinson, D. W., and Masters, W. H.: Management and Treatment of Infertility, J. Missouri M. A., to be published.

5. Falk, H. C., and Kaufman, S. A.: What Constitutes a Normal Semen? Fertil. & Steril. **1**:489-503 (Nov.) 1950.

The plastic caps[6] are manufactured in different sizes, as described by Whitelaw.[3] The size of the cap to be used in each case is determined during a routine examination of the patient some time prior to the date of the first insemination. The capping procedure is preceded by douching with a specially prepared neutralizing solution[6] that has been shown to be optimally favorable for sperm survival.[7] The rubber glove to be used is devoid of powder and is washed, as is the cap, with the same douche solution just before the insertion of the cap intravaginally. The entire ejaculate is poured into the cap. With the patient in the lithotomy position, and while the labia are spread with the gloved hand, the cap, containing the ejaculate, is placed in the introitus (fig. 1).

The index and middle fingers of the gloved hand are immediately placed in extension over the open portion of the cap. The cap is then slipped along the posterior vaginal wall while the gloved fingers maintain the open plane of the cap in an almost perfect horizontal position, so as to prevent spillage of the contents. When contact with the cervix is made by the finger tips, slightly added pressure toward the posterior vaginal wall almost always allows the cervix to fall directly into the cap as the fingers are slipped away from the open portion (fig. 2). Minimal pressure is then made by the gloved fingers on the bottom of the cap to apply it more securely to the cervix. For all practical purposes the specimen is now sealed inside the cap at the cervical os.

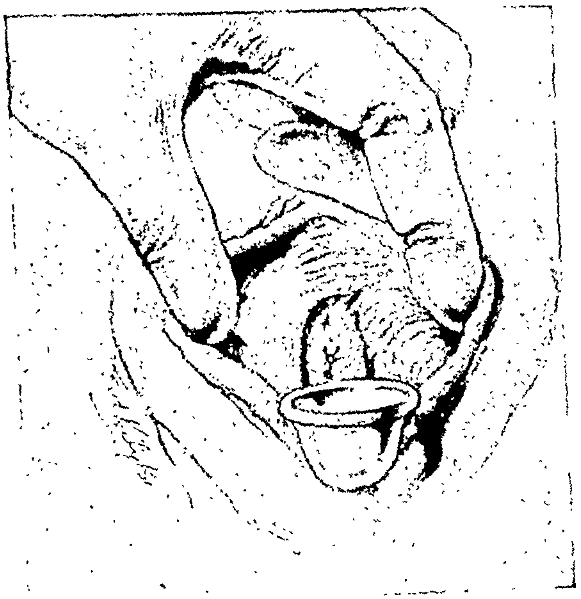

Fig. 1.—The cervical cap in place at the introitus.

When the cap has been properly fitted and inserted, a minimal negative pressure develops within the cap, as noted on removal. It is usually more difficult to remove a cervical cap than to insert one successfully. With an anteverted uterus and a cervix pointing posteriorly, this method of application can be easily mastered so that no spillage occurs. This is not true in some cases in which (*a*) the uterus is retrodisplaced and the cervix points anteriorly in the long axis of the vagina or (*b*) the introitus and vagina are significantly small with an accompanying element of voluntary or involuntary spasm so that application cannot be made properly without much tilting and turning of the cap. In these cases a cap is used that has previously had a hole drilled through it directly beneath the rim. These caps are empty when fitted to the cervix, eliminating the problem of spillage during the application. The cap is then exposed with a vaginal speculum and rotated so that the hole is directly anterior. The semen specimen is drawn into a luer-lok® syringe through a 20-gage needle that has been specially prepared for injection of the semen into the cap. The distal third of the needle has been bent into a semicircle (fig. 3). This allows the needle to be slipped through the hole in the cap alongside the cervix without puncturing the cervix.

It is necessary to withdraw the air within the cap, allowing the air to rise above the level of the semen in the syringe before the semen is injected. After the injection, the needle is removed from the cap, the bottom of the cap is pressed lightly so as to make a tighter fit, and the cervix itself seals off the injection hole. Placing the injection hole immediately under the rim instead of in the bottom of the cap, as described by other workers, eliminates the necessity of covering the hole with beeswax.

All caps are allowed to remain in place for a minimum of eight hours and are usually removed within 16 hours. In repeated tests no living spermatozoa have been found in any of the caps after eight hours with the cap in place. Samples of intracervical mucus, taken at the eight-hour limit, have almost always shown multiple viable spermatozoa.

RESULTS AND COMMENT

It can be conservatively presumed that an optimal capping schedule occurred with each patient on the average of two out of three cycles. Arbitrarily it was decided to include in this series of couples only those credited with a minimum of five cycles involving capping, unless, of course, success occurred with an earlier capping. It was felt, conservatively, that each couple selected for analysis

TABLE 1.—*Fifteen Cases of Primary Sterility with Oligospermia*

Duration of Sterility	No.	Conceived	Aborted	Failures
1½-3 yr.	5	5	1	0
3-5 yr.	7	3	0	4
5-8 yr.	3	2*	0	1
Totals	15	10	1	5

* An intensively treated couple with a seven-year sterility problem with marked oligospermia who achieved conception twice by capping and is considered as two separate units.

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6. The plastic cap and the neutralizing material for douches (nutri-sal® and nutri-disc®) were supplied by Dr. Katherine Kuder and the Ortho Pharmaceutical Corporation.

7. Siegler, S. L.: The Value of Physiologic Substrates in Sperm Migration in Selected Cases of Human Infertility: Observations on Series of 106 Patients, Am. J. Obst. & Gynec. **51**: 13-21 (Jan.) 1946.

8. Rubenstein, B. B.: The Relation of Cyclic Changes in Human Vaginal Smears to Body Temperatures and Basal Metabolic Rates, Am. J. Physiol. **119**: 635-641 (July) 1937; Vaginal Smear—Basal Body Temperature Technic and Its Application to Study of Functional Sterility in Women, Endocrinology **27**: 843-856 (Dec.) 1940. Shorr, E.: An Evaluation of the Clinical Applications of the Vaginal Smear Method, J. Mt. Sinai Hosp. **12**: 667-688 (May-June) 1945.

significant group of the study. Results of insemination procedures in these patients yielded 10 (67%) pregnancies (table 1), one of which terminated with abortion.

Comparison of these results with those of any other series comprising a similar group of couples and undergoing all other methods of therapy is indeed striking. Intensive management of male infertility, including desiccated thyroid and other hormonal therapy, has failed to yield results even remotely comparable to the 67% salvage obtained in this short series. This fact becomes even more significant when it is noted that nine of the 10 successes involved sperm counts ranging below 30 million per cubic centimeter, with seven of these below 15 million per cubic centimeter. Careful analysis of the 15 couples of this group shows that all had been the subjects of intelligent and adequate infertility management and therapy before the first fitting of the cervical cap. Twelve had been seen by other physicians with the chief complaint of inability to conceive before being included in the present study. Whitelaw's series of 32 couples who had been married two years or longer without a pregnancy showed a 37% salvage by the capping technic.

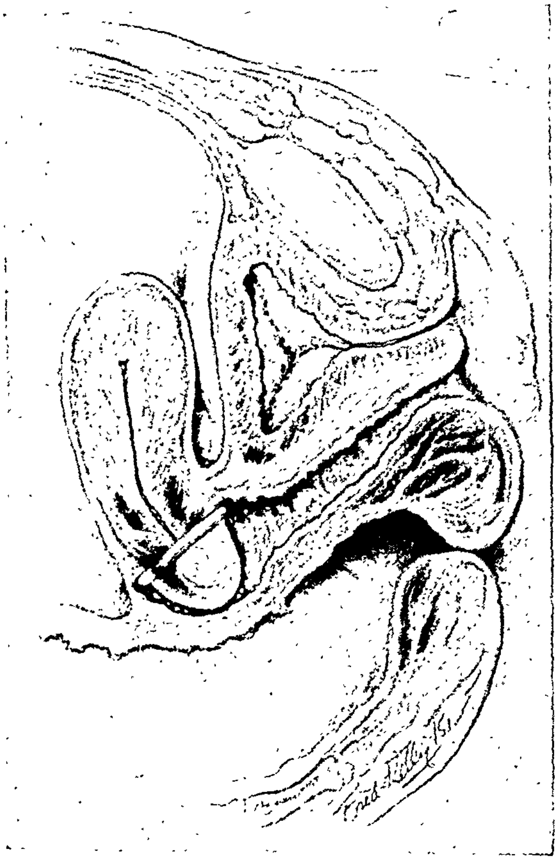

Fig. 2.—The cervical cap properly fitted to the cervix.

During the period of time covered by the present study, four additional cases of infertility without prior conception but with marked oligospermia came to us for management. Multiple semen analyses on each of the husbands showed sperm counts in every instance well below 30 million per cubic centimeter. Two ranged between 5 and 10 million, one between 10 and 15 million, and one between 20 and 25 million per cubic centimeter. All exhibited poor initial motility before thyroid and vitamin B complex therapy was started, and one, on repeated examinations showed 40% to 50% abnormal morphological forms. The duration of sterility in these couples ranged from one to eight years. Yet, during the two to four month intensive program of initial management and therapy preceding anticipated insemination of the husband's semen by capping, all four female partners became pregnant. Two of the four conceived a few days after hysterosalpingography. These cases serve to emphasize the absolute necessity for complete evaluation and thorough treatment of any barren couple before one resorts to use of the cervical cap, if one is to be reasonably objective in evaluating the clinical results obtained from the capping technic.

The use of the cervical cap is certainly of equivocal import in problems of secondary sterility, i. e., couples presenting a history of conception without the aid of insemination procedures prior to the present period of infertility. Nine such couples in the over-all capping series fall into this category. Additional diagnoses of oligospermia were made in four cases in this group (J. C., M. G., R. M., and E. T.), and in two of these four (J. C. and M. G.), pregnancy ensued concomitantly with the employment of the cap. This may be significant but remains a clouded issue, owing to absence of knowledge regarding the state of the semen at the time of the first conception. The importance of this prior knowledge is accentuated by the report of Falk and Kaufman,[5] who showed 15% of the subjects in their random series of normally fertile men to have a sperm count of less than 60 million per cubic centimeter. These workers belittle the importance attached to oligospermia per se and stress abnormal morphology and poor motility and longevity as the outstanding features in male infertility. Essentially, then, if the semen of these four men had been within normal limits at the time of the first conception and had since deteriorated, these two pregnancies would assume significance.

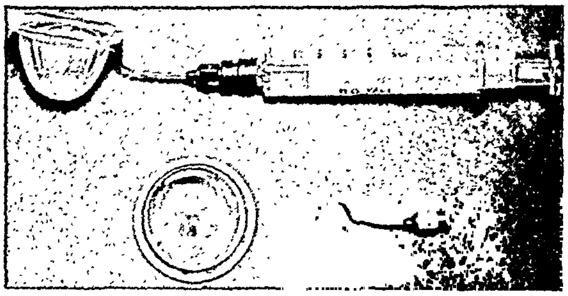

Fig. 3.—Equipment used in placing ejaculate in cervical cap through an injection hole after the cap has been fitted.

The remaining five secondary sterility cases (S. M., J. L., H. C., C. F., and A. H.) had associated normal semen specimens. In each of these the possible factor of residual damage to the endometrium was eliminated by adequate endometrial biopsy. Three couples (S. M., J. L., and H. C.) attained success with the cap, and two failed. Perhaps, in the cases of the three conceptions, the efficacy of the cap lay in speeding up the occurrence of fertilization that might have eventually taken place in the course of proper clinical management. This is borne out by the development of pregnancy in one (C. F.) of the two cases in which capping failed five months after the last of nine cycles in which insemination was practiced. Although insemination had been regarded as of little value in this case and had been discontinued, a therapeutic regimen was still being followed by both partners at the time of conception.

In the same vein, reference must be made to one of the three couples with primary infertility problems without semen inadequacy that are included in the over-all capping series. Failure by the capping technic was recorded in all three, but one couple later conceived without aid of the insemination program. This occurred while the couple was on vacation but still adhering to a strict regimen of sterility management. This suggests the possibility of a significant role played by nervous tension. Vaginismus has been noted during capping procedures in particular, and infertility workers in general have made much of genital spasm in the female. Much attention has recently been focused on the psychic aspects of sterility, and certainly the unusual circumstances of insemination procedures, as compared with ordinary coitus, can initiate or intensify unusual emotional reactions which may, in turn, become manifest organically by localized muscle spasm and vascular congestion. In this respect it is also of interest to note that in four of the 15 oligospermic primarily infertile couples the male partner was a physician. In each of these cases the husband was taught to use the cap and insemination was practiced at home. All four wives, no longer subjected to the procedure in the confines of a professional environment under the management of persons other than their husbands, promptly became pregnant.

TABLE 2.—*Results in Twenty-Seven Cases of Infertility*

Duration of Sterility	No.	Conceived	Aborted	Failures
1½-3 yr.	13	10	1	3
3-5 yr.	9	3	0	6
5-8 yr.	5	2*	0	3
Totals	27	15	1	12

* See footnote in table 1.

TABLE 4.—*Individual Successes*

Couple	V. C.	J. C.	E. M.*	S. M.	J. L.	A. M.	A. F.	R. M.	M. G.	H. C.	C. W.	M. M.	M. R.	E. M.*	W. W.
Previous conception	No	Yes	No	Yes	Yes	No	No	No	Yes	Yes	No	No	No	No	No
Duration of sterility	2	1½	7	2½	2	2	2	3	2½	2	4	1½	2½	7	4
Age of wife	25	28	34	25	36	30	24	30	29	28	29	28	27	35	25
Age of husband	26	47	34	29	43	33	29	30	30	27	29	28	29	35	30
BMR of wife	— 2%	— 4%	—14%	—16%	+ 8%	—17%	—25%	—15%	—13%	+ 3%	—20%	—21%	—16%	—14%	—22%
BMR of husband	— 8%	—18%	— 5%	—25%	+ 8%	— 4%	—23%	—15%	—19%	— 2%	—20%	—24%	—31%	— 5%	—15%
Sperm count (millions/cc.)	50-60	15-20	5	70-80	120	25-30	20-25	10-15	50-60	60	5	7-15	5-10	5	10-15
Sex hormone deficiency in wife †	+	0	+	+	0	0	0	0	++	0	+	0	++	+	0
Cycles capped	11 ‡	3	2	3	2	3	3	2	1	2	7	5	3	1	2

* See footnote in table 1.
† As determined by vaginal smears and endometrial biopsy; + = progesterone deficiency and ++ = combined progesterone and estrogen deficiency.
‡ Aborted at two months.

TABLE 5.—*Individual Failures*

Couple	J. W.	D. S.	M. B.	E. S.	C. F.	R. P.	D. C.	M. S.	R. M.	A. H.	E. T.	H. W.
Previous conception	No	No	No	No	Yes	No	No	No	Yes	Yes	Yes	No
Duration of sterility	3	7	1½	7	5	3	3	5	2	1½	8	3
Age of wife	27	32	22	27	28	28	29	34	36	36	37	25
Age of husband	26	34	24	27	30	32	28	34	36	35	39	28
BMR of wife	—11%	+ 3%	—18%	—13%	— 5%	— 9%	—17%	+ 3%	—14%	—23%	0	— 3%
BMR of husband	+ 5%	— 6%	—11%	—23%	—19%	—13%	+ 4%	—21%	—11%	+ 1%	—16%	— 2%
Sperm count (millions/cc.)	20	60-70	70	40-50	85-200	40-120	30-40	10-15	14-20	80-135	15-25	5-10
Sex hormone deficiency in wife *	0	0	0	0	+	0	+	0	0	0	+	0
Cycles capped	19	14	6	13	9	11	7	12	15	7	10	6

* See second footnote in table 4.

Summarizing the entire series, 15 (56%) pregnancies resulted in 27 couples in association with the use of the cervical cap (table 2). Oligospermia and inadequate semen were considered the prime contributing factors in 12 of these 15 successful cases. The remaining three cases, all of which were associated with semen specimens within the normal range, constituted problems in secondary sterility (table 3). If only couples with oligospermia are considered in the series, including both primary and secondary sterility cases, then an incidence of 12 (63%) pregnancies is recorded in a total of 19 couples. By the same token, if analysis is made only of those cases involving no history of prior conception, then 10 (56%) of 18 cases terminated with pregnancy.

TABLE 3.—*Results of Insemination in Primary and Secondary Cases with Reference to Sperm Count*

Sperm Count (Millions/Cc.)	No. of Cases	Conceived		Aborted		Failures	
		Primary	Secondary	Primary	Secondary	Primary	Secondary
> 60	8	0	3	0	0	3	2
50-59	2	1	1	1	0	0	0
40-49	1	0	0	0	0	1	0
30-39	1	0	0	0	0	1	0
15-29	6	2	1	0	0	1	2
5-14	9	7*	0	0	0	2	0
Totals	27	10	5	1	0	8	4

* See footnote in table 1.

From the information summarized in tables 1 and 2, it becomes obvious that, in accord with sterility studies in general, the incidence of successful pregnancy is approximately inversely proportional to the duration of the sterility. With reference to the total series (table 2), of the 13 cases of one and one-half to three years' duration, pregnancy was achieved in 10, while of the 14 cases of three years' duration or more, conception occurred in only five. In the group of patients limited to oligospermic primary infertility (table 1), the five couples with only one and one-half to three years of sterility prior to capping achieved conception without exception, while the 10 couples with three years or more of sterility had five successes and five failures.

In the over-all group of 15 successful couples, 12 achieved conception in three or less cycles of capping (table 4). The remaining three, all with oligospermic primary sterility problems, attained success in 5, 7, and 11 cycles, respectively, the last terminating in abortion at two months. Thus it can be seen that success, when it was attained, occurred relatively rapidly in the majority of cases. The implication is obvious. Assuming that ovulation can be detected fairly accurately, the chances of pregnancy resulting in conjunction with the employment of the cervical cap become markedly decreased if success has not been attained before the fourth cycle of capping. This is borne out by the number of capping cycles credited to the failures in the complete series. Of the 12 unsuccessful couples, 11 or more cycles of capping were done in 8 cases and in 1 as many as 19 times (table 5). In three of the five cases of failure in the oligospermic primary infertility group, more than 11 cycles of capping were done.

CONCLUSIONS

1. The use of the cervical cap in primary sterility resulting principally from relative semen inadequacy is unquestionably indicated, but only subsequent to a period of thorough investigation and management.
2. The cervical cap in cases of secondary sterility is probably of considerable importance with especial regard to shortening the duration of infertility. Capping is not as valuable in secondary as in primary sterility problems.
3. The cervical cap is a useful adjunct toward solving the problem of the barren marriage, but it is far from a panacea. Unless all other factors are eliminated initially, the cervical cap will be misused. Since the actual process of capping according to schedule is extremely tedious to doctor and patient alike, it becomes almost mandatory that one precede any program of capping with adequate periods of diagnosis and therapy.
4. In any well-selected and well-managed series of patients subjected to the therapeutic regimen of insemination with the husband's semen by the cervical cap technic, pregnancy usually will occur early in the regimen, if it is to occur at all as a direct result of this treatment.

SUMMARY

The results of a study of a series of infertile couples subjected to the therapeutic technic of the cervical cap are presented. Of 15 cases of primary sterility with oligospermia, conception was achieved in 10 (67%). Fifteen (56%) pregnancies resulted in the entire group of 27 cases in which the cervical cap was employed.

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NONTRAUMATIC CERVICAL DISLOCATIONS IN RHEUMATOID SPONDYLITIS

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and
Henry H. Nash, M.D., Framingham, Mass.

Although the occurrence of dislocations in peripheral joints affected with rheumatoid arthritis is well known, the fact that cervical spine subluxations may likewise complicate rheumatoid spondylitis has not been generally realized. Similarly, rheumatoid spondylitis has received only scant mention in the literature as a cause of spontaneous atlantoaxial dislocations, which have been repeatedly ascribed to cervical or nasopharyngeal inflammations in childhood, rheumatic fever, and tuberculosis of the spine. Ely [1] has reported atlantoaxial subluxation that occurred in a patient with rheumatoid arthritis. His patient, however, had a history of injury that may have precipitated the dislocation. More recently Stammers and Frazer [2] reported spontaneous subluxation of the atlas in a 30-year-old man who had a five year history suggestive of rheumatoid spondylitis, although this diagnosis was not mentioned. Rand [3] described a case of progressive subluxation of the atlas that caused a classic Brown-Sequard syndrome that was relieved by strong head traction followed by operative cervical fusion. Although this patient was known to have rheumatoid spondylitis with activity in the cervical region, the relationship of this disease to the subluxation was not recognized.

The following cases are reported to emphasize that lower cervical as well as atlantoaxial dislocations may occur in cervical spondylitis, and to increase awareness of these complications so that they may be recognized early and treated promptly.

Case 1.—A 23-year-old white man entered the Cushing Veterans Administration Hospital on Sept. 21, 1948, with a history of rheumatoid spondylitis for the past three years. In 1945, while he was in Japan, stiffness and pain in the low back began that progressed gradually. He had also had intermittent pain in both knees. In 1946 he noted gradual onset of cervical pain and progressive rotation of his head to the right, which remained until entry. In the past year his pain had decreased, but the entire spine became stiff.

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Reviewed in the Veterans Administration and published with the approval of the Chief Medical Director. The statements and conclusions published by the authors are the result of their own study and do not necessarily reflect the opinion or policy of the Veterans Administration.

[1] Ely, L. W.: *Subluxation of the Atlas: Report of Two Cases*, Ann. Surg. 54:20 (July) 1911.

[2] Stammers, F. A. R., and Frazer, P.: Spontaneous Dislocation of the Atlas with Report of a Case, Lancet 2:1203 (Nov. 25) 1933.

[3] Rand, C. W.: The Neurosurgical Patient: His Problems of Diagnosis and Care, Springfield, Ill., Charles C Thomas, Publisher, 1944, p. 47.

Examination revealed a rigid spine, with slightly increased upper dorsal kyphosis, and the neck fixed in slight extension, with the head rotated about 30 degrees to the right (fig. 1). On manipulation there was a slight feeling of "give" in the cervical spine, but no visible motion and fixed rotation. There was moderate spasm of the paravertebral muscles. Chest expansion was ½ in. (1.27 cm.). Results of laboratory tests were consistent with active rheumatoid arthritis.

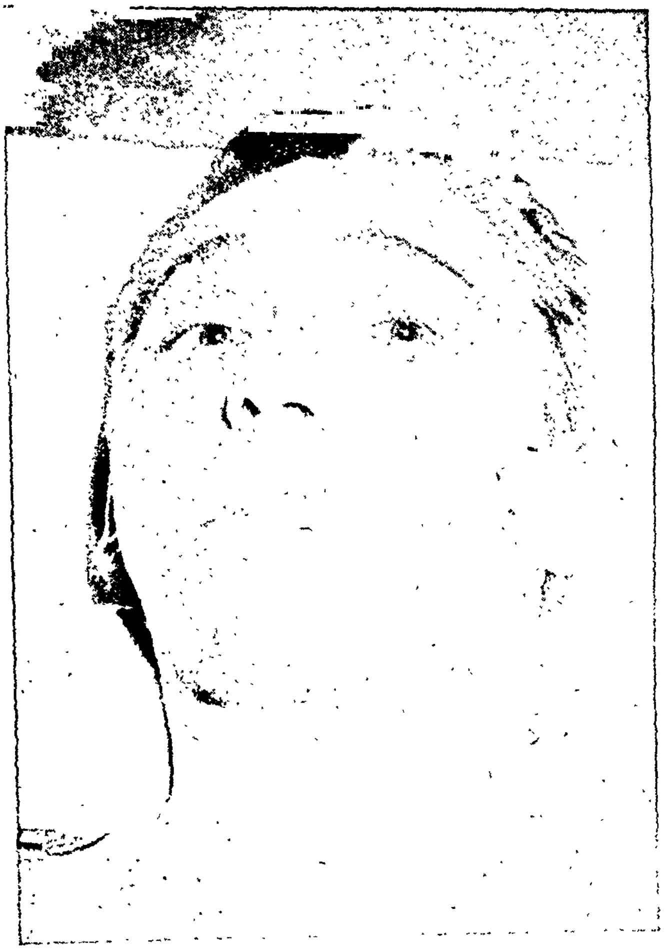

Fig. 1 (case 1).—Rotation deformity of neck in a patient with rheumatoid spondylitis.

Conservative treatment, consisting of bed rest, physiotherapy, and head traction by means of a Sayre sling, was unsuccessful in straightening the cervical rotation. A test of motion under thiopental (pentothal®) sodium anesthesia showed the deformity to be fixed.

In the lateral projection, roentgenograms of the cervical spine revealed (fig. 2) an abnormally wide space of 8 mm. between the anterior arch of the atlas and the odontoid process. The atlas was abnormally tilted, with elevation of its posterior arch producing an increase to 15 degrees (measured according to Coutts) of its angle of inclination to the axis. There was a well-marked forward position of the posterior atlantic arch. In the anteroposterior view (fig. 2) through the open mouth the left atlantoaxial joint space was obliterated, while the right was normal. These changes indicated a left unilateral dislocation of the atlas upon the axis.

All the other cervical articulations on roentgenograms showed varying degrees of irregularity and loss of definition of the articular surfaces, with poor outline of the joint spaces and regional osteoporosis. The joint spaces between the fifth and sixth segments were widened. The posterior longitudinal ligament was calcified. The findings were those of rheumatoid spondylitis. The lower lumbar articulations as well as the sacroiliac joints appeared fused on the roentgenograms; while the upper lumbar articulations showed changes of the same nature as those in the cervical spine. The lumbar paraspinal ligaments showed faint calcification. The dorsal intervertebral joints were not clearly visualized and no abnormalities were demonstrable.

In April, 1949, when it was recognized that the major part of the deformity was due to an atlantoaxial dislocation, the patient was placed in skull traction, employing Vinke tongs. His bed was placed on the right side of the ward, so that twisting motions of his head would be to the left. He remained in traction for four and one-half months, with a maximum pull of 42 lb. (19.9 kg.) for three and one-half months. No reduction of the dislocation was obtained, although subjectively the patient felt there had been a slight correction, judging by his field of vision.

Surgical attempts at correction were not deemed advisable, since the deformity was a unilateral dislocation at the atlantoaxial facet on the left, which allowed ample room for the spinal cord. At no time did the patient have any definite neurological symptoms or signs referable to the dislocation.

Case 2.—A 35-year-old white man was admitted with a complaint of neck pain radiating to both arms. There was a past history of progressive arthritis appearing seven years prior to entry in the lower back and hips. The present illness began eight months prior to admission, when he noted aching pain in the neck. Symptoms became severe enough to prevent his working some six months prior to admission. Four months prior to admission he was given a course of cortisone (cortone®) therapy at another hospital, at first intensively, with gradually diminishing doses; at the time of admission he was still receiving weekly injections of cortisone. Nevertheless, the patient noted persistent neck pain and x-ray examination disclosed an anterior subluxation of the atlas on the axis. Despite head halter traction and immobilization in a cervical brace, the patient two weeks prior to entry to this hospital had noted the onset of numbness and tingling in the arms and hands, which in the few days prior to entry extended to the lower legs and feet as well.

Physical examination showed a thin, chronically ill man with a stiff back and flexion deformity in the neck, with limitation of motion and marked muscle spasm. There was evidence in the upper extremities of loss of position sense and hyperactive reflexes. The blood sedimentation rate was 21 mm. per hour.

In the lateral projection, roentgenograms of the cervical spine revealed (fig. 3) anterior dislocation of the atlas upon the axis, as indicated by a marked forward position of both the anterior and posterior atlantic arches. The interval between the anterior arch and the odontoid process was 12 mm. The extreme forward position of the posterior arch demonstrated a high degree of encroachment upon the spinal canal. This marked displacement of the atlas and the absence of rotary neck deformity indicated that the dislocation involved the articular facets on both sides. The anteroposterior view through the open mouth showed no asymmetry in the position of these facets, and did not reveal the dislocation. Coutt's angle was not increased. The articulations between the second and third cervical segments showed irregularity and loss of definition of the joint surfaces characteristic of rheumatoid arthritis. Similar changes were present in the

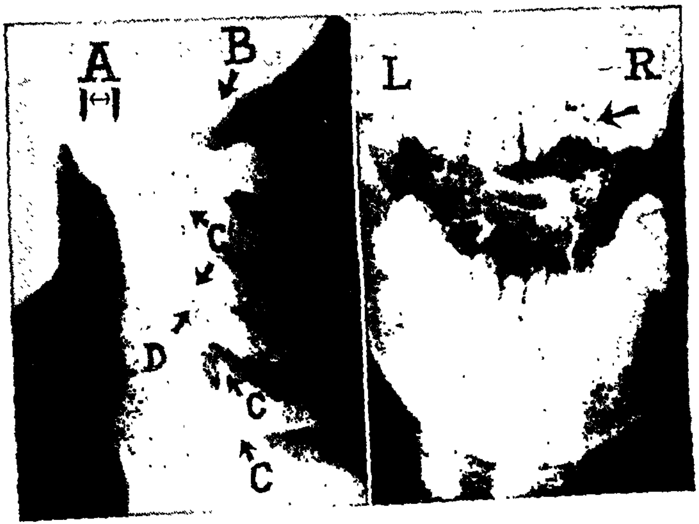

Fig. 2 (case 1).—On the left the atlantoaxial dislocation is shown on lateral view. There is an abnormally wide interval between the anterior atlantic arch and the odontoid process (A), and the posterior atlantic arch is elevated and in a forward position (B). Rheumatoid arthritic changes (C) and calcification of posterior longitudinal ligament (D) are also evident. On the right the anteroposterior view through the mouth shows that the right atlantoaxial joint space is normal (arrow) and the corresponding joint on the left is obliterated.

joints between the seventh cervical and first thoracic segments, but the other cervical articulations did not reveal any involvement.

The patient was placed in skeletal traction by means of wires placed through burr holes in the vertex. With the patient supine, 20 lb. (9.9 kg.) of traction was applied to the skull, and the cervical region was hyperextended by a firm cervical pillow. Serial roentgenograms over the subsequent five days disclosed progressive reduction. Traction was continued for six weeks but was reduced gradually after the second week to 5 lb. (2.2 kg.) by the end of the sixth week. Symptoms disappeared and sensation returned. After removal of the traction wires, he was ambulatory wearing a Taylor back brace incorporating a jury mast to maintain the neck in extension. A posterior shell from head to hips was used at night.

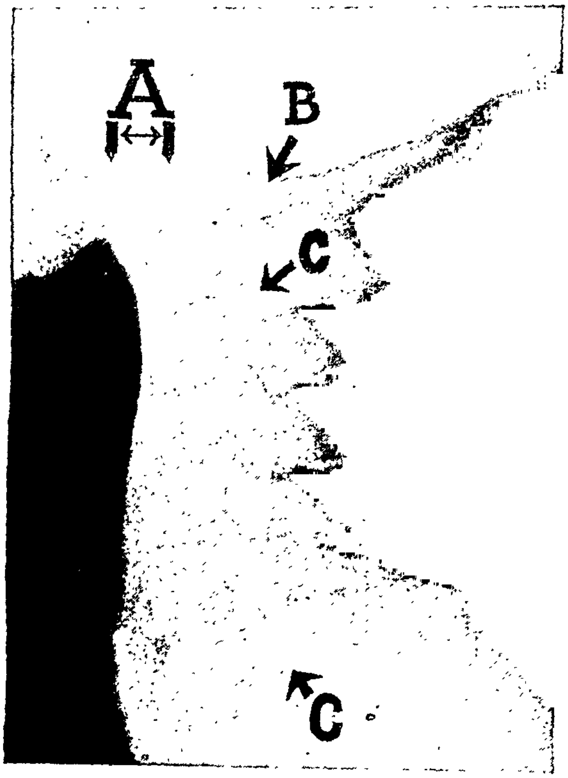

Fig. 3 (case 2).—Atlantoaxial dislocation revealed on lateral view. There is an abnormally wide gap between the anterior atlantic arch and the odontoid process (*A*). The posterior arch of the atlas encroaches on the spinal canal in its forward position (*B*), and rheumatoid arthritic involvement can be seen (*C*).

At the time of this report, some eight months later, he was asymptomatic and roentgenograms demonstrate maintenance of the reduction. Clinically there was evidence of good rotatory motion through the atlantoaxial joints. A prolonged period of protection by means of the above-mentioned brace was contemplated.

Case 3.—A 31-year-old white man was admitted with complaints of anorexia, weight loss, weakness, and cervical and dorsal back pain. Symptoms had progresseed since onset four years before admission. Examination showed an emaciated young man with a thoracic kyphosis and rigidity and spasm of the neck, in a position of forward flexion and right rotation of 20 degrees. The entire dorsolumbar spine was rigid. The blood sedimentation rate ranged above 30 mm. per hour.

X-ray examination of the cervical spine (fig. 4) disclosed rheumatoid arthritic involvement of all the articulations, ranging from irregularity and narrowing of the joint spaces to incomplete fusion. There was a 2 mm. forward subluxation of the fifth cervical articulation on the sixth cervical, which was not recognized at that time. The patient was treated with salicylates, physiotherapy, partial bed rest, and intermittent light cervical traction by means of a head halter. Six months later a progressive increase in his cervical deformity was noted. He complained of radiating pain in the right shoulder and arm. Two weeks later he reported numbness and tingling in the arm and hand. No abnormal neurological signs were elicited. At this time repeat cervical roentgenograms (fig. 5) showed a 2 cm. forward dislocation of the fifth cervical on the sixth, with about 30 degress kyphotic and right lateral angulation and marked encroachment upon the neural canal. There was a very wide separation of the opposing subluxated articular surfaces of the posterior articulations at this level, bilaterally, revealing marked erosion of the superior facets of the sixth cervical.

Skull traction was instituted in the same way as in case 2. After 12 hours of 20 lb. (9.9 kg.) of traction roentgenograms disclosed a complete reduction of the dislocation with considerable distraction. Traction was decreased to 15 lb. (6.8 kg.) and the neck gradually extended, as in case 2. Roentgenograms, however, disclosed a reversal of the dislocation with the fifth cervical now nearly a centimeter posteriorly displaced on the sixth cervical. Resumption of the original flexed position was necessary, but in spite of this a moderate residual posterior displacement remained. For 12 weeks 10 lb. (4.5 kg.) of traction was maintained, following which the patient was made ambulatory supported by a brace similar to that used in case 2. A molded cervical collar was employed at night.

One year later roentgenograms showed minimal posterior displacement of the fifth cervical, with narrowing of the interspace between the fifth and sixth cervicals. The articular facets at this level appeared recalcified, with partial fusion of these joint spaces. Prolonged brace support was indicated, since it was felt that operative cervical fusion was dangerous in such a debilitated patient. His severe radiating pain disappeared completely during the first week of traction and did not return.

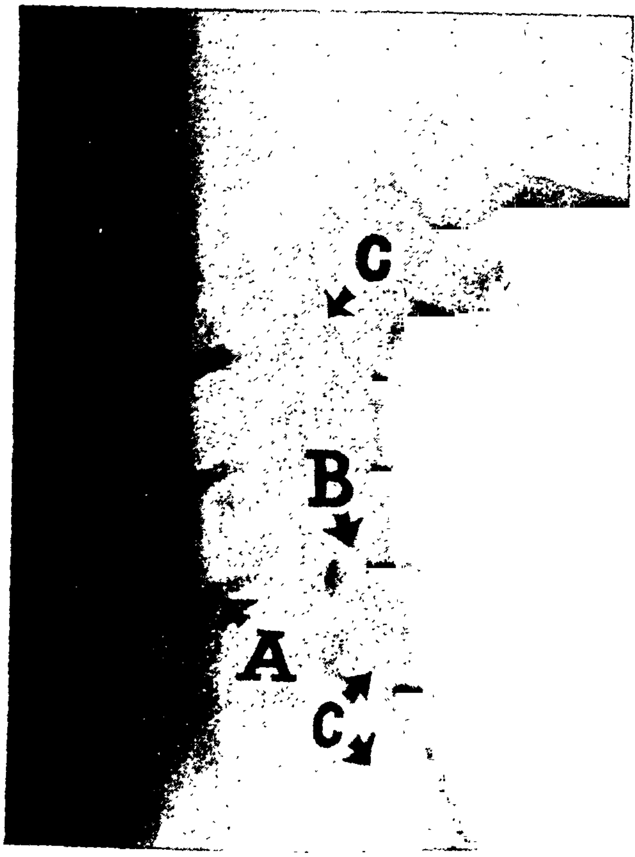

Fig. 4 (case 3).—Slight anterior dislocation of the [illegible] is shown, and there is forward subluxation and [illegible]. There is subluxation of articular facets (*B*) and rheumatoid arthritic involvement of articulations (*C*).

Case 4.—This 52-year-old man was examined for evaluation of the status of his long-standing generalized rheumatoid arthritis. There was a five year history of multiple joint

For two years prior to examination he had noted stiffness of the neck and tingling paresthesias in both hands. No injury was recalled. There were no neurological abnormalities on physical examination, and further study was made impossible because the patient did not desire treatment or hospitalization.

X-ray examination demonstrated a 5 cm. forward dislocation of sixth cervical on the seventh cervical, which could be distinguished both at the bodies and at the facets (fig. 6). This dislocation appeared to be longstanding because of calcific bridging anteriorly across the interspace between these bodies. The articulations between the second, third, and fourth cervical segments showed rheumatoid arthritic involvement, with irregularity and narrowing of joint outlines. With the exception of the joints at the level of the dislocation, the other cervical articulations appeared normal.

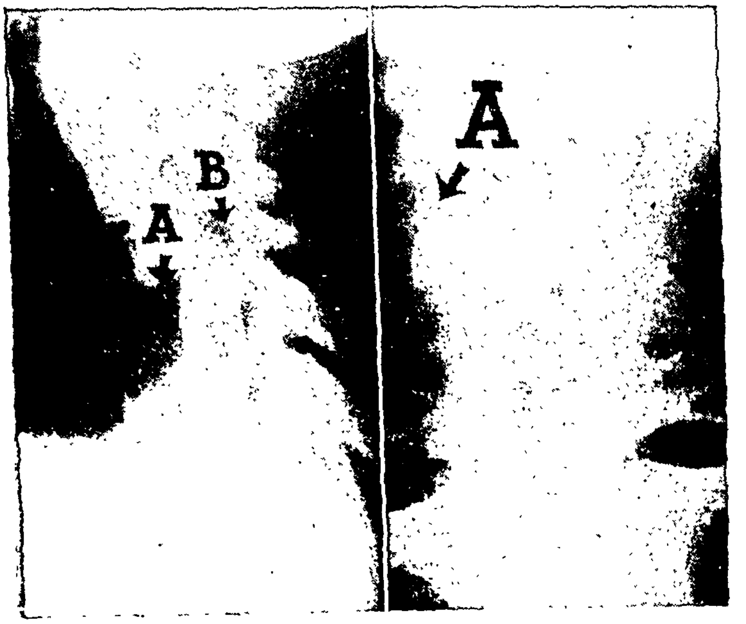

Fig. 5 (case 3).—*Full development of the dislocation of the fifth cervical on the sixth. On the left in the lateral view marked forward displacement of the fifth cervical, with angulation and encroachment on the spinal canal, is seen (A). Subluxation with wide separation of articular facets and erosion of superior facets of the sixth cervical is evident (B). On the right the anteroposterior view shows angulation of the spine to the right (A).*

COMMENT

The etiological factors involved in spontaneous cervical dislocations have been discussed in the literature mainly as related to the atlantoaxial joint. However, one can readily understand that the same pathological process occurs in other cervical articulations. Martin [4] has summarized the sequence of events in spontaneous atlantoaxial dislocation as follows: (1) cervical infection with hyperemia; (2) vertebral decalcification and loosening of ligamentous attachments; and (3) forward slipping of one or both lateral articular facets of the atlas. This sequence is in general agreement with that described by most authors. Jones [5] and others have emphasized the role of hyperemia in this dislocation. Coutts [6] and Berkheiser and Seidler [7] contended that the dislocation is preceded by distention of the capsules of the atlantoid joints, including relaxation of the transverse ligament. From all these observations one can fairly deduce that hyperemia, capsular distention, and ligamentous relaxation, such as may be present in active rheumatoid involvement of the cervical spine, are important etiological factors in spontaneous cervical dislocations. It thus appears that these dislocations occur during the active phase of the rheumatoid arthritis. It seemed clinically evident that our patients had active rheumatoid changes in their cervical spines at the time of subluxation. This is in accord with the views of Stammers and Frazer, who believe that the atlantoaxial dislocation in their patient took place during an active phase of arthritis. In the cases reported here the deformity of the neck due to the dislocation was insidious in onset. Similarly in Stammers and Frazer's case progressive rotation and increasing flexion of the head took place over a period of one year. This slow development of the dislocation may be an important factor in the prevention of serious spinal cord injury. The reason for this gradual progression, in contradistinction to the sudden onset usually present in atlantoaxial dislocations associated with nasopharyngeal infection, is not clear. Hess, Abelson, and Bronstein [8] suggest that constant spasm of the cervical muscles is the probable mechanism in the production and maintenance of subluxation.

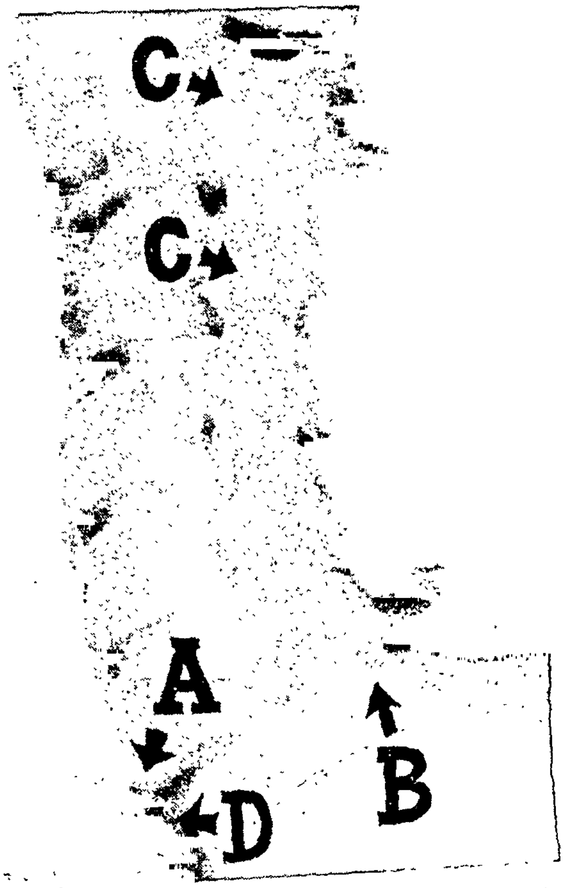

Fig. 6 (case 4).—Dislocation of the sixth cervical on the seventh. Anterior displacement of the body of the sixth cervical (A), subluxation of the articular facets (B), rheumatoid arthritic changes (C), and calcific bridging of the interspace (D) are evident.

While most of the reported cases of atlantoaxial dislocation occurred without clinical evidence of spinal cord compression, varying degrees of cord involvement have been mentioned, ranging from slight manifestations to quadriplegia. Generally no neurological symptoms are experienced in unilateral dislocations, as in case 1. In these instances, according to Hess, Abelson, and Bronstein,[8] the dislocations are rotary, with the odontoid process as the pivotal point. There is no reduction in size of the spinal canal and consequently no encroachment on the cord. In Stammers and Frazer's case spinal cord symptoms were present, but it is not stated whether the atlantoaxial dislocation was unilateral or bilateral. Recently Titrud and associates [9] reported on a patient with nontraumatic atlantoaxial dislocation with quadriplegia who recovered. Concerning cervical dislocations that are bilateral and extensive, as in cases 3 and 4, the importance of possible spinal cord injury must be emphasized. In these two patients the changes in neurological signs and symptoms during treatment were dramatic, the relief from radiating arm pain and paresthesia being the most outstanding.

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[4] Martin, R. C.: *Atlas-Axis Dislocation Following Cervical Infection,* J. A. M. A. **118:** 874 (March 14) 1942.

[5] Jones, R. W.: *Spontaneous Hyperemic Dislocation of Atlas,* Proc. Roy. Soc. Med. **25:** 586 (Feb.) 1932.

[6] Coutts, M. B.: Atlanto-Epistropheal Subluxations, Arch. Surg. **29:** 297 (Aug.) 1934.

[7] Berkheiser, E. J., and Seidler, F.: Non-Traumatic Dislocations of the Atlanto-Axial Joint, J. A. M. A. **96:** 517 (Feb. 14) 1931.

[8] Hess, J. H.; Bronstein, L. P., and Abelson, S. M.: Atlanto-Axial Dislocations, Unassociated with Trauma and Secondary to Inflammatory Foci in the Neck, Am. J. Dis. Child. **49:** 1137 (May) 1935. Hess, J. H.; Abelson, S. M., and Bronstein, L. P.: Spontaneous Atlanto Axial Dislocations: Possible Relation to Deformity of the Spine, Am. J. Dis. Child. **64:** 51 (July) 1942.

The radiological evidence of atlantoaxial dislocation is quite definite. In the lateral view there is an abnormal forward position of the anterior arch of the atlas in relation to the odontoid, as stated by many authors. Normally the interval between this arch and the odontoid should not be more than 1 to 2 mm. The forward position of the posterior arch of the atlas in relation to that of the axis produces a definite angulation of the normally smoothly curved line drawn along the inner borders of the posterior cervical arches to the posterior lip of the foramen magnum outlining the posterior limits of the spinal canal. Furthermore in the lateral view there may be an abnormal inclination of the atlas, so that its posterior arch is brought away from that of the axis closer to the occiput. Coutts has stated that the upper normal range of the inclination of the atlas against the axis is 10 degrees. This angle is measured by a line joining the inferior borders of the anterior and posterior atlantic arches and a line joining the inferior border of the articular processes of the axis with the inferior border of its spinous process. The obliteration of the atlantoaxial joint space in the anteroposterior projection is considered to be the lateral mass of the atlas overlapping the articular facet of the axis. Berkheiser and Seidler believed that this obliteration is pathognomonic of unilateral atlantoaxial dislocation. However, Englander [10] and Coutts have stressed the fact that the overlapping may be normal during rotation and flexion of the head.

Dislocations occurring below the atlantoaxial joint are generally obvious if the malalignment of the cervical bodies is observed. Here one can visualize more clearly the subluxation of the corresponding articulations and the deossification in the articular facets. Follow-up studies may, as in case 3, indicate recalcification in these facets.

Many methods of treatment have been applied in cases reported in the literature. Manipulation under anesthesia, fixation in a plaster jacket, and head traction with sling or tongs have been tried with varying results. Jones [5] is of the opinion that fixation is unnecessary and inadvisable because it produces additional vertebral decalcification. He stated that dislocations of brief duration could be reduced by hyperextension under anesthesia, but he did not mention treatment in the long-standing cases. Generally in cases of long duration reported in the literature, treatment was unsuccessful and persistent fixed deformity resulted. Of the four patients described here, only in those who received early active treatment was the deformity corrected. The question of surgical fusion of the involved segments of the servical spine is still unsettled. The advantage of obtaining a rigid bony fixation to prevent any possible future recurrence of subluxation is obvious. However, in case 3 surgical fusion was strongly considered but was not done because of the patient's severely debilitated condition. This general debility is usually present in patients suffering from this disease. In addition, the results in cases 2 and 3 in which satisfactory correction of the dislocation was obtained have been most encouraging without surgical intervention. To this we must add the obvious fact that the over-all tendency of rheumatoid spondylitis is to produce fusion of the affected joints over a period of time.

SUMMARY

Spontaneous cervical dislocation may occur in the course of rheumatoid spondylitis and is of insidious onset, with progressive development of rotation and flexion deformities. The dislocation takes place during an active phase of rheumatoid disease, when hyperemia and capsular distention in the region of the cervical joints plus deforming muscle spasm are important causative factors. It is evident that when recognition is prompt, vigorous treatment in an early stage can prevent the fixed deformities resulting from such dislocations and relieve signs and symptoms of spinal cord compression.

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[9] Titrud, L. A.; McKinlay, C. A.; Camp, W. E., and Hannah, H. B.: *Non-Traumatic Atlanto-Axial Dislocation: Report of a Case with Recovery After Quadriplegia,* J. Neurosurg. **6:** 174 (March) 1949.

[10] Englander, O.: Non-Traumatic Occipito-Atlanto-Axial Dislocation: *Contribution to Radiology of Atlas,* Brit. J. Radiol. **15:** 341 (Dec.) 1942.

Barbiturate Addiction.—The administration of barbiturates for long periods of time is a widespread medical practice, and undoubtedly addiction may follow. We are only beginning to appreciate the scope of the problem, and there is no precise information available. Some studies indicate there are more addicts to barbiturates than to morphine, and it is evident that barbiturate addiction is increasing every year.

In the past, it was considered that sedative drugs did not produce true addiction. There is enough information now available to show this hypothesis to be untrue. By any definition, the barbiturates are addicting, with psychic phenomena, tolerance, deterioration of the addict, and withdrawal symptoms. The latter may be of many forms. Convulsions are outstanding, but often the picture closely resembles delirium tremens. In other cases, withdrawal of the drug leads to yawning, nausea, restlessness, irritability, and so on, just as does withdrawal of morphine from a narcotic addict.

Many physicians, aware only of the sedative actions of barbiturates, cannot appreciate that the drugs also may produce a marked stimulation much desired by the addict. In many ways barbiturates act like alcohol. In fact, these two drugs may have synergistic effects. Many individuals develop a [illegible] and other evidence of escape from inhibitions, particularly after taking one of the short-acting barbiturates. In still other cases the barbiturates may produce violent excitement, [illegible], or delirium.—Walter Modell, M. D., Addiction as a Complication of the Therapeutic Use of Drugs, *New York State Journal of Medicine,* March 15, 1952.

PRESSURE TREATMENT OF MAXILLARY SINUSITIS

J. Mathews Robison, M.D., Houston, Texas

Therapeutic application of physical pressure to various parts of the body has been in use for many years. Pressure has been used to facilitate the healing of wounds, burns, fractures, and chronic ulceration of the skin and in skin grafting. Pressure has also been used to prevent hemorrhage, interstitial cavitation, edema, and accumulation and stagnation of excess interstitial fluid. Smith[1] was the first to apply pressure in the maxillary sinus with a balloon. He inflated a balloon in the sinus to apply pressure to and prevent edema in a skin graft in the sinus. Later Shea[2] inflated a balloon in the maxillary sinus to hold the walls of the sinus in position after reduction of a fracture.

METHOD OF TREATMENT

For several years I have treated certain types of maxillary sinusitis in selected patients by applying local pressure to the mucosa of one or both maxillary sinuses. I accomplished this by making a small opening into the maxillary sinus through the nasoantral wall under the inferior turbinate. This antrostomy is made close to the attachment of the inferior turbinate to the lateral nasal wall, and in or about the anteroposterior center of its attachment. Through this antrostomy a small balloon is inserted into the sinus and inflated with iodized oil. Iodized oil is used to inflate the balloon, not for its medicinal effect, but because its specific gravity is higher than the specific gravity of the sinal secretion. As the balloon is inflated it displaces the secretion in the sinus and produces pressure on the sinal mucosa.

The balloon used is made of natural rubber and is about 1 in. (2.5 cm.) in diameter before being deflated for introduction into the sinus. It is formed around the self-retaining deformable head of a no. 12 French rubber catheter. The balloons are manufactured with various sizes of self-retaining catheter heads inside the balloons. The various sized self-retaining heads inside the balloons are necessary to occlude properly the various-sized openings through which the balloons are inserted. The deformable self-retaining catheter head allows the balloon and catheter head to be inserted through an antrostomy that is only slightly larger than the shaft of the catheter. After the balloon is inserted into the sinus, the deformable catheter head re-forms. As the balloon is inflated it produces pressure on the sinal mucosa and the catheter head occludes the antrostomy and prevents the balloon from herniating into the nasal cavity.

To insert the balloon through the antrostomy into the sinus, it is useful first to inject through the catheter into the balloon about 1 cc. of jelly lubricant. This allows the inside surface of the balloon to adhere and remain deflated during its introduction. An obturator with a curved tip is introduced into the catheter head, and the head is deformed by traction on the catheter. The deflated balloon is draped symmetrically around the catheter head, the outside of the balloon is lubricated, and the balloon is inserted through the antrostomy into the sinus. To inflate the balloon, a 10 cc. syringe containing 7 cc. of iodized oil is attached to the catheter, and the plunger is withdrawn to exhaust any air remaining in the balloon. If sinal secretion or blood is aspirated into the syringe, the balloon has been punctured and another balloon will have to be inserted.

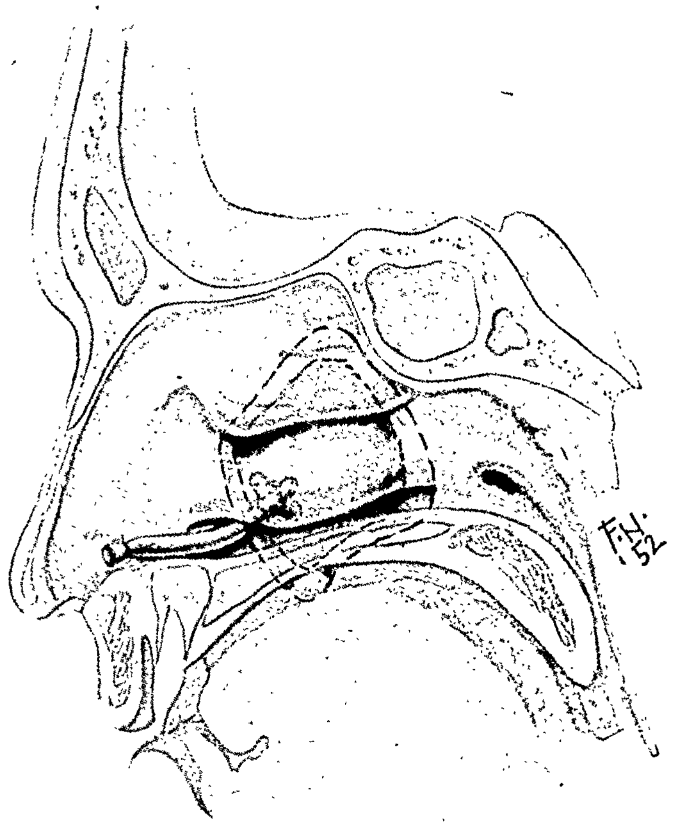

Fig. 1.—Drawing showing the balloon and catheter in place in the maxillary sinus. The balloon is inserted into the maxillary sinus through a small antrostomy made through the nasoantral wall under the inferior turbinate. The antrostomy should be only large enough to allow the balloon and its contained deformed catheter head to be inserted into the sinus. As pressure is applied by injection of iodized oil into the balloon the reformed catheter head occludes the sinal side of the antrostomy and prevents herniation of the balloon into the nasal cavity. The balloons are manufactured with various sizes of self-retaining heads to fit various-sized openings. Immediately after the balloon is inserted and inflated, it is spherical. A few weeks later, after the iodized-oil with which the balloon is inflated has reduced the elasticity and contractility of the rubber, the balloon adapts itself to the irregular contour of the sinus, thereby producing slight uniform pressure on the edematous sinal mucosa. The catheter is cut off and tied so that its nasal end rests about the mucocutaneous junction. The catheter is tied with a double strand of no. 9 braided silk, with the knot on the side of the catheter opposite the nasal septum. The balloon usually remains in the sinus for about three months and may be reinserted if indicated.

Only enough iodized oil is injected into the balloon to create a comfortable sensation of fulness or pressure in the sinus. The catheter is tied with a cord in the nasal vestibule so that the knot is on the side of the catheter away from the nasal septum. The catheter is cut off so that its intranasal end lies inconspicuously in the nasal

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The drawings for this article were prepared by Mr. George W. Newman and Mr. F. W. Schmidt and their associates in the Department of Medical Illustration, University of Texas School of Medicine, Galveston, Texas.

[1] Smith, F.: Plastic Surgery; Its Interest to the Otolaryngologist, J. A. M. A. **75**: 1554 (Dec. 4) 1920.

[2] Shea, J. J.: Management of Fracture Involving Paranasal Sinuses, J. A. M. A. **120**: 745 (Nov. 7) 1942.

vestibule at the mucocutaneous junction. The cavity of the normally developed maxillary sinus often is shaped like a truncated pyramid, or it may be an irregular oval or contain partial septums. Rarely is it round like a balloon, so that a balloon can make pressure equally and simultaneously on the mucosa, covering all of its walls. For this reason a round balloon cannot completely fill an irregular cavity without producing more than comfortable pressure on parts of the walls of the sinus. However, after the iodized oil has been in contact with the inside of the rubber balloon for a period of time, the rubber gradually loses most of its elasticity and slowly conforms to the irregularities of the sinal cavity.

RESULTS AND PATHOLOGICAL PROCESSES INVOLVED

Most of the patients who have had balloons inserted into their maxillary sinuses have worn them for two or three months. Some, particularly those with primary purulent sinusitis, have had good results in a shorter period of time. In those patients who are particularly susceptible to recurrent infection and have allergic sinusitis, nasal polypi, and bronchial asthma of long duration, it is sometimes necessary to insert the balloons two or three times, at intervals of a few months, before a lasting cure is obtained. After the balloons have been removed from the sinuses, the patient is given any indicated treatment, such as injection of antigens, vaccines, or nonspecific protein. If antigens are injected while the balloons are in the sinuses, the dosage should be reduced to avoid giving the patient asthma.

One removes the balloon by cutting the string from around the catheter and aspirating the oil from the balloon through a curved cannula passed through the catheter into the self-retaining head. Traction is made on the catheter, and a curved hemostat is passed into the antrostomy, where the balloon is grasped and removed.

The application of local pressure to the mucosa of the maxillary sinus was designed primarily to promote absorption of the excess interstitial fluid present in the sinal mucosa during allergic sinusitis. The principal characteristics of the pathological condition present in the sinal mucosa during primary allergic sinusitis are eosinophilic infiltration and edema. These pathological processes may resolve spontaneously after acute allergic rhinitis and sinusitis, or they may persist; as the excess interstitial fluid becomes stagnant, it may become susceptible to recurrent viral or bacterial infection.

During development of the pressure treatment of allergic sinusitis, it became evident that, when allergic sinusitis with secondary infection was being treated, the symptoms and signs of the secondary infection were the first to subside. This observation instigated the pressure treatment of primary purulent sinusitis, which has proved to be very effective.

To understand better the therapeutic indications and effects of the application of physical pressure to the mucosa of the maxillary sinus, we should consider briefly some of the fundamental principles of the physiological and functional pathological factors related to the application of pressure to the sinal mucosa. The mucosa of the normal maxillary sinus is seldom more than 0.02 mm. in thickness [3] and, when normal, is a nonabsorbing membrane. However, after the mucosa reacts to irritation or infection by becoming edematous, its interstitial spaces are "open"; it readily absorbs certain substances that may come in contact with its surface or that may be injected into its stroma. If the edema of the sinal mucosa persists and the interstitial fluid becomes stagnant, antigens or their conjugates derived from inhalation, ingestion, or injection may accumulate in the interstitial spaces of the sinal mucosa. This partly accounts for the persistence of the edema of the sinal mucosa that is characteristic of allergic sinusitis. During the allergic state, allergens tend to produce their acute and sudden local tissue reactions in the areas of the body that have the least tissue pressure.[4] These are the same areas that become edematous first during hypoproteinemia, i. e., skin, subcutaneous tissue, and mucous membrane. The mucosa of the maxillary sinus probably has the least tissue pressure of any of the tissues of the body, because it is the first or one of the first tissues to become edematous during lowering of the colloidal osmotic pressure of the blood plasma such as is seen in hypoproteinemia.

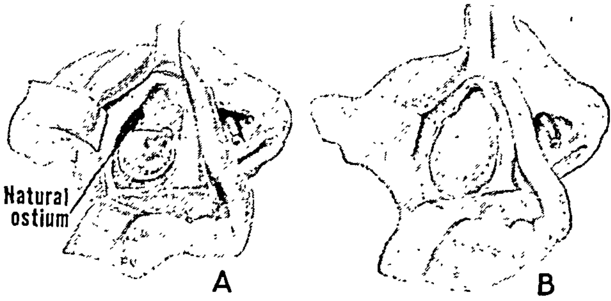

Fig. 2.—Drawings showing an approach through the anterior sinal wall as an aid to insertion of the balloons. In certain conditions due to developmental irregularities, such as a thick nasoantral wall or intrasinal septums, or in pathological conditions such as *complete filling of the sinus with polypi,* it is necessary to facilitate the insertion of the balloon by an approach through the canine fossa as in diagram *A.* The opening through the fossa rarely is made as large as is shown in the diagram. It should be only large enough to allow removal of the larger intrasinal polypi or *other obstruction. The* sinal mucosa should not be removed completely. Diagram *B* shows the balloon inflated with iodized oil and filling the sinus. Usually the balloon is not inflated to the extent shown until it has been partially inflated for several weeks.

The normal sinal mucosa must possess the following three characteristics to perform its necessary functions: 1. Its sinal surface must be covered with epithelial cells having active cilia. 2. Its glands must be able to secrete sufficient mucus to provide a constant cover over the cilia. 3. It must be capable of becoming edematous and of swelling until it approximates or entirely fills the sinus.[5] This latter function is important during pathological states because, by becoming edematous, the sinal mucosa increases its tissue pressure as it swells against its inherent contractility and the unyielding bony walls of the sinus.

Some of the factors that govern the production, distribution, and absorption of extravascular fluid are (1) colloidal osmotic pressure of the blood plasma, (2) arterial capillary pressure, (3) venous capillary pressure, (4) hydrostatic pressure, (5) atmospheric pressure, (6) tissue pressure, and (7) physical pressure. Of these factors, those that are particularly important to the problem of promoting absorption of excess interstitial fluid from the sinal mucosa are colloid osmotic pressure, tissue pressure, and physical pressure.

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[3] Piersol, G. A.: Normal Histology, with Special Reference to the Structure of the Human Body, Philadelphia, J. B. Lippincott Co., 1892, ed. 2, p. 403.

[4] Robison, J. M.: A Method of Preventing Contact Conjunctivitis, Am. J. Ophth. 33:964 (June) 1950.

[5] Robison, J. M.: Management of Allergic Sinusitis, Instructional Course, Annual Meeting of American Academy of Ophthalmology and Otology, Oct. 14-18, 1951.

The variables of colloidal osmotic pressure are (1) time, (2) membrane area, (3) difference in concentration of the colloid across the membrane, (4) size of the diffusing molecules, (5) temperature, and (6) physical pressure.[6] Of these variables, those that can be used best to promote absorption of edema fluid are time and physical pressure.

The application of physical pressure to the mucosa of the maxillary sinus is designed primarily to support or increase the tissue pressure of the sinal mucosa.

The variables that are important to tissue pressure are as follows (taken in part from Drinker[7]):

1. Tissue pressure is gaged by the resistance a tissue offers to distension of its interstitial spaces by edema fluid.
2. Tissue pressure according to its magnitude resists capillary filtration and promotes capillary absorption and lymph flow.
3. Tissue pressure is related to the contractility and density of the tissue and increases as the interstitial spaces become filled with newly formed fibroblasts.
4. Tissue pressure may be increased by application of physical pressure to the surface of the part.

The constantly changing pericellular environment of the cells of the body is maintained by arterial capillary filtration, venous capillary absorption, and lymph flow. Lymph flows normally in parts of the body by active and passive motion, muscle contraction, massage, gravity, and tissue pressure. The nose and paranasal sinuses, when normal, are deprived of muscle contraction to promote the flow of lymph and must depend chiefly on gravity and tissue pressure.[8] During pathological states, if the tissue reaction is severe, all air-containing cavities of the body have the air replaced by secretion and/or edematous tissue. This facilitates lymph flow by allowing arterial pulsations to be transmitted to the lymph vessels by hydrostatic pressure through an incompressible fluid medium. This is accomplished in the sinuses during pathological states by the sinal mucosa's becoming edematous and approximating the capacity of the sinus. As this occurs the swelling of the sinal mucosa facilitates drainage of the sinus by forcing the sinal secretion to the region of, or through, the ostium of the sinus.

To understand better how a balloon that is inserted into the maxillary sinus and inflated with iodized oil aids or supplants the pathological behavior of the sinal mucosa, one should consider briefly the pathological changes present in the sinal mucosa during primary purulent sinusitis, primary allergic sinusitis, and allergic sinusitis with secondary infection.

During primary acute purulent sinusitis the secretion passes through the catarrhal, serous, purulent, and mucoid stages characteristic of purulent infection of mucous membranes. If during the course of the infection the cilia or mucus glands of the sinal mucosa fail to function properly or if the sinal mucosa does not swell sufficiently to force the secretion to the region of, or through, the ostium, the secretion is retained, resolution of the infection is delayed, and the subacute and chronic stages of the disease may ensue. After retention of highly proteinized secretion in the sinal cavity and highly proteinized fluid in the stroma of the sinal mucosa, newly formed fibroblasts appear in the stroma of the sinal mucosa. This fibrosis during prolonged purulent sinusitis usually is uniform throughout the stroma; if it is extensive, it interferes with the blood supply to the cilia and mucus glands and leads to the formation of a septic sinal cavity.[9]

COMMENT

Acute purulent maxillary sinusitis or any acute inflammation in the nose or sinuses is a definite contraindication to the application of local pressure to the sinal mucosa. During the subacute and chronic stages of purulent maxillary sinusitis, resolution of the infection usually is prompt and complete after the application of pressure to the sinal mucosa unless extensive irreversible pathological changes are present. The degree of reversibility of the sinal pathological changes may be determined partly by biopsy. However, a useful clinical criterion is observation of the amount of mucus present in the secretion as irrigation of the sinus is repeated. Usually, if the sinal mucosa can secrete a reasonable amount of mucus, the pathological changes are not completely irreversible. This criterion cannot be used for certain infections caused by gram-negative organisms, because these frequently suppress the secretion of mucus almost completely, although the blood supply to the mucus glands is good.

Pressure has been applied in most of the patients treated for purulent maxillary sinusitis for 8 to 12 weeks. Evidence is accumulating that a shorter period of application may be effective in certain patients who have had infection for a short period of time. Usually patients who can be greatly improved by an intranasal antrostomy alone can be cured completely by insertion of a balloon through the antrostomy and production of pressure on the sinal mucosa. In most patients the application of pressure in the sinus produces a more prompt and complete cure of subacute and chronic purulent sinusitis than the Caldwell-Luc or other radical maxillary sinus operation. Normal transillumination and normal ciliary action usually are restored to the maxillary sinus after the application of pressure, whereas these qualities rarely follow radical maxillary sinus operation. One should apply pressure in the maxillary sinuses of most patients with subacute or chronic purulent maxillary sinusitis in an effort to effect a cure before advising radical operation. Often it is surprising how a sinus that has contained pus for many years will apparently return to normal function and transilluminate normally after the application of local pressure to the mucosa.

Relief or cure of the bronchopulmonary symptoms of cough and bronchitis may occur simultaneously with re-

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[6] Davson, H., and Danielli, J. F.: The Permeability of the Natural Membranes, New York, Macmillan Company, 1943.

[7] Drinker, C. K., and Yoffey, J. M.: Lymphatics, Lymph and Lymphoid Tissue: Their Physiological and Clinical Significance, Cambridge, Mass., Harvard University Press, 1941.

[8] Robison, J. M.: Lymph Pump Mechanism of Nose and Paranasal Sinuses, Laryngoscope 60:489 (May) 1950.

[9] Robison, J. M.: Pressure Treatment of Purulent Maxillary Sinusitis, Texas State J. Med. 47:281 (May) 1951.

moval from the sinuses of the reservoir of secretion that had been draining into the trachea and bronchi. When bronchiectasis has developed as a result of drainage from the sinuses, usually it is necessary, in addition to curing the sinuses, to make repeated bronchoscopic examinations and aspirate the secretion from the involved bronchi to promote resolution of the bronchial infection. Some of these patients have gained 20 to 35 lb. (9 to 13.5 kg.) and have been able to avoid segmental lobectomy. Some of the structural changes in the bronchi, such as dilatation and sacculation, may remain in the bronchi, but if infection is not present, the patient may have no symptoms. This excellent relief from bronchiectasis is not as likely to follow the radical maxillary sinus operation as it is to follow the application of pressure in the maxillary sinuses. When purulent maxillary sinusitis is cured by the application of pressure, the cure is practically complete and there is no excess secretion draining into the bronchi. However, only too often after the radical maxillary sinus operation the cure is incomplete and there remains a slight continuous drainage into the bronchi that may be just enough to continue the bronchiectatic process.

Allergic sinusitis is a disease of the sinal mucosa that occurs in sensitized persons owing to inhalation, ingestion, or injection of certain antigens into the body. The primary pathological process present in the sinal mucosa is edema of the stroma, which may occur episodically or perennially. The edema may be transitory and disappear rapidly after exposure to the antigen, or the excess fluid may remain in the interstitial spaces, become stagnant, and render the sinal mucosa susceptible to recurrent infection. Allergic edema of the sinal mucosa often is accompanied by allergic rhinitis, tracheitis, bronchitis, and bronchial asthma. Allergic sinusitis is always a bilateral disease, but localization of secondary infection in one or more sinuses may cause it to appear to be unilateral. Eosinophils usually are found in the secretion in the sinuses and respiratory tract during acute allergic states, but they may disappear or almost disappear during secondary infection. Allergic sinusitis often resolves spontaneously. However, if an antigen or some of its products enter the sinal mucosa and remain there, they may produce persistent edema that is the beginning of a cycle of recurrent infection and progressive pathological changes in the sinal mucosa, characterized by the formation of alternating areas of fibrosis and dilated interstitial spaces.

As infection occurs in this type of mucosa and the tissue pressure rises, polypoid protrusion of the portions of the sinal mucosa that contain the dilated tissue spaces project into the sinal and nasal cavities.[10] Progressive polypoid degeneration of the sinal mucosa may occur until the maxillary sinuses and nasal cavities become entirely filled with mucous polypi. Apparently filling of these cavities with polypi is nature's method of increasing the tissue pressure of the sinal mucosa in an effort to maintain the constantly changing pericellular environment for the cells of the mucosa. Also, filling of the sinuses and nasal cavities with polypi prevents entrance of the inhaled antigens.

Application of pressure to the sinal mucosa during allergic sinusitis is most efficient during the early stages of the edema of the mucosa, before extensive polypoid degeneration has occurred. Acute allergic sinusitis, like acute purulent sinusitis, is a contraindication to the application of pressure. If the acute stage fails to resolve and the sinal mucosa remains edematous, the patient may manifest increased susceptibility to infection by frequent attacks of purulent sinusitis and tracheobronchial infection. Certain patients will have hay fever, bronchial asthma, and acute allergic sinusitis simultaneously. After the hay fever has subsided, the asthma and sinusitis may persist. These patients should be treated for their allergy by medication and desensitization. Also, it may be necessary to treat the sinusitis by irrigation of the sinuses. If the asthma subsides promptly after irrigation of the maxillary sinuses, application of pressure in the maxillary sinuses probably will effect cure or relief of the asthma.

Patients with a high eosinophil level in the blood and asthma should have their sinuses irrigated repeatedly, and all measures should be used to bring their asthma under control before pressure is applied in their sinuses. If this is not done, the patient may go into immunologic shock within 24 to 48 hours after insertion of the balloons. An internist or general allergist should always be in consultation with the otolaryngologist during the management of patients with allergic sinusitis and severe asthma. After all the more conservative measures have been used and the edema in the sinal mucosa persists, pressure should be applied to remove the edema of the sinal mucosa and prevent the progressive pathological changes that follow in the wake of recurrent secondary infection.

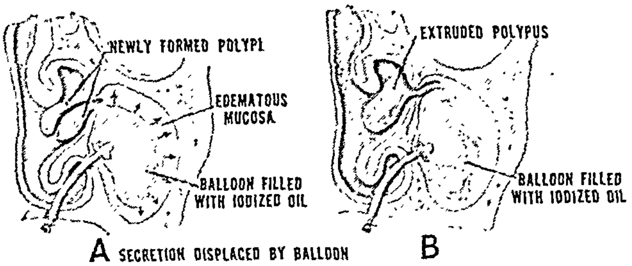
NEWLY FORMED POLYPI
EDEMATOUS MUCOSA
BALLOON FILLED WITH IODIZED OIL
A
SECRETION DISPLACED BY BALLOON
EXTRUDED POLYPUS
BALLOON FILLED WITH IODIZED OIL
B

Fig. 3.—Drawings showing the physical effects of application of pressure to the edematous mucosa of the maxillary sinus. Diagram *A* shows the mechanism of production of newly formed polypi in the middle meatus as pressure is exerted on the edematous sinal mucosa. This mechanism is similar to the formation of polypi in the middle meatus following an acute inflammatory process in the maxillary sinus. If the ostium of the sinus is sufficiently large to allow herniation of the mucosa, intranasal polypi will form as the mucosa becomes edematous and approaches the capacity of the sinus. The arrows indicate the direction of the lines of force exerted by the balloon and the lines of force exerted by the inherent contractility of the previously normal but recently edematous sinal mucosa. Diagram *B* shows a polypus that was present in the maxillary sinus previous to insertion of the balloon. The polypus is being forced into the middle meatus. This type of polypus differs histologically from a recently formed polypus and may become strangulated. It may be removed without disturbing the balloon.

The patient should not have pain in the sinal area at any time while wearing balloons in the maxillary sinuses. Exceptions to this are the pain that may be caused by irritation of the nasal septum or vestibule by the tip of the catheter and the pain, which should be of short duration, that occurs immediately after the balloon is filled with oil or after oil is added. The latter type of pain usually subsides as soon as the balloon displaces the secretion in the sinus. Each time oil is added to the balloon the patient should remain under observation until the sinal area is entirely comfortable or until there is only a slight sensation of fulness. In certain instances, one may have to remove marked irregularities of the nasal septum to gain access to the inferior meatus. Septal spurs and ridges, if prominent and placed anteriorly, may become ulcerated by pressure of the catheter.

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[10] Robison, J. M.: Pressure Treatment of Allergic Sinusitis, Arch. Otolaryng. 45: 405 (April) 1947.

As pressure is applied to the edematous sinal mucosa, the interstitial fluid is forced in the direction of the least resistance, which is toward the ostium of the sinus. As this occurs, folds or newly formed polypoid protrusions of the sinal mucosa may appear in the nasal cavity in the middle meatus and produce nasal stenosis. Also, well-formed polypi present in the sinus may be forced through the ostium and prolapse into the middle meatus, where they may become strangulated. These polypoid protrusions should be removed any time they become prominent. Care should be taken to avoid grasping the balloon during removal of these polypi, for occasionally the balloon also may herniate through a large sinal ostium.

In accepting patients for treatment who have advanced allergic sinusitis, nasal polyposis, bronchial asthma, reduced vital capacity of the lungs, pulmonary emphysema, pulmonary hypertension, chronic bronchitis, and bronchiectasis, one should impress on them that application of pressure to the sinal mucosa may not be a rapid or quick cure for all of their symptoms. It is important that they know that it may be necessary for them to be under observation, with intermittent periods of treatment, for two or three years. With this understanding, they are gratified if they obtain complete relief from their symptoms in a few months and are cooperative if they find that it is necessary for them to have the balloons reinserted two or three times. Treatment during this period should include in addition to the application of pressure, desensitization to antigens and measures designed to increase the patient's resistance to respiratory infections.

SUMMARY

1. Application of local pressure to the mucosa of the maxillary sinus is accomplished by insertion into the maxillary sinus of a self-retaining catheter with a balloon formed around its deformable, self-retaining head. The balloon is inserted through a small intranasal antrostomy made under the inferior turbinate and is inflated with iodized oil. The oil does not contact the sinal mucosa and is not used for its medicinal value. Iodized oil is used because it is heavier than the sinal secretion and, as it distends the balloon, it displaces the sinal secretion and exerts slight pressure on the sinal mucosa.

2. The application of pressure in the maxillary sinus is contraindicated during any acute inflammatory reaction in the nose or sinuses, particularly acute purulent rhinitis or sinusitis, acute allergic rhinitis or sinusitis, seasonal hay fever, and acute uncontrolled bronchial asthma and particularly if the condition is associated with a high eosinophil level of the blood.

3. Application of pressure in the maxillary sinus is indicated and has been used with excellent results during subacute and chronic purulent maxillary sinusitis and subacute and chronic allergic sinusitis, and it has relieved and apparently cured certain patients with allergic rhinitis, sinusitis, and bronchial asthma.

4. Application of pressure in the maxillary sinus reduces the susceptibility of the sinus to recurrent infection and, when combined with bronchoscopic drainage of bronchiectatic areas in the lungs, has resulted in cure of the bronchiectasis. This procedure does not restore the dilatation and sacculation of the bronchi to normal, but, when there is no drainage from the sinuses and no infection in the bronchi, the structural changes in the bronchi produce no symptoms.

5. Application of pressure in the maxillary sinus does not cure all types of maxillary sinusitis, e. g., pansinusitis and dentigerous sinusitis in certain advanced cases, but, when it is effective, it produces a more thorough cure and restores the sinus nearer to normal than any other operation.

6. It appears that application of pressure in the maxillary sinus produces better results in selected patients with sinusitis than the Caldwell-Luc or other radical maxillary sinus operation. After the application of pressure, normal transillumination and normal ciliary action usually are restored to the sinus and the volume and character of the secretion from the sinus is, or approaches, normal. Only rarely does the radical maxillary sinus operation achieve this favorable end-result.

7. When the physicians become more familiar with the application of pressure to the mucosa of the maxillary sinus and the indications and contraindications for its use are defined better, it appears that the application of pressure may replace the radical maxillary sinus operation except in certain selected cases in which there are irreversible structural or pathological changes in the maxillary sinuses.

1304 Walker Ave. (2).

The Electrocardiogram.—In the final analysis the electrocardiogram, like other clinical data, is interpreted empirically. It is as good as the judgment of the interpreter.

Any kind of electrocardiogram may be normal in a person under 30 years of age. After the age of 70 almost any change in the electrocardiogram may be merely a part of the aging process. An isolated abnormal electrocardiogram does not inevitably indicate organic heart disease. It may imply some temporarily disturbed function, as in the innervation or hormonal control of the heart, constituting part of the picture of psychosomatic disturbances, and may actually have been engendered by fear or excitement associated with the taking of the record.

Even an abnormal electrocardiogram associated with organic heart disease may be benign or occult, requiring no alteration in the manner of living of the patient. The abnormal electrocardiogram is less important than the circumstances under which it occurs. Taking an electrocardiogram does not absolve the clinician from also using sound clinical judgment. Contrariwise, a normal electrocardiogram is no guarantee that the heart is normal. The electrocardiogram is only part of the clinical examination, an important adjuvant which should never be omitted in a patient with heart disease or in a person in the coronary age group. Under such circumstances it serves as a scanning test, possibly throwing out hints to the alert clinician to examine his patient more carefully.

Experience has shown that the clinical utility of the electrocardiogram depends upon the information it gives about several of the physiologic properties of the heart, including its irritability, rhythmicity and conductivity. It furnishes no information concerning the contractile power of the heart or its tone.—Louis N. Katz, M.D., Advances in Electrocardiography, *The Medical Clinics of North America*, January, 1952.

CLINICAL NOTES

HERNIATION OF THE URETER INTO THE SCIATIC FORAMEN ("CURLICUE URETER")

William C. Beck, M.D.
William Baurys, M.D.
Jean Brochu, M.D.
and
William A. Morton, M.D., Sayre, Pa.

Herniation of a ureter into the sciatic foramen is extremely rare. We have been able to find only one previously reported case, that of Lindbom.[1] That author was unable to find any previous similar report. We have recently observed this condition and feel that its description is worth while. Because of the typical appearance, diagnosis should not be difficult.

REPORT OF A CASE

The patient, a white woman aged 66, had long had diffuse arteriosclerotic disease with chronic auricular fibrillation. She had also had a left hip fracture with nonunion. In March, 1949, while in another hospital, she had a cerebrovascular accident, and gangrene of the left leg developed. The gangrene was ascribed to an embolus. A left midthigh amputation was performed on the leg with the nonunion of the hip.

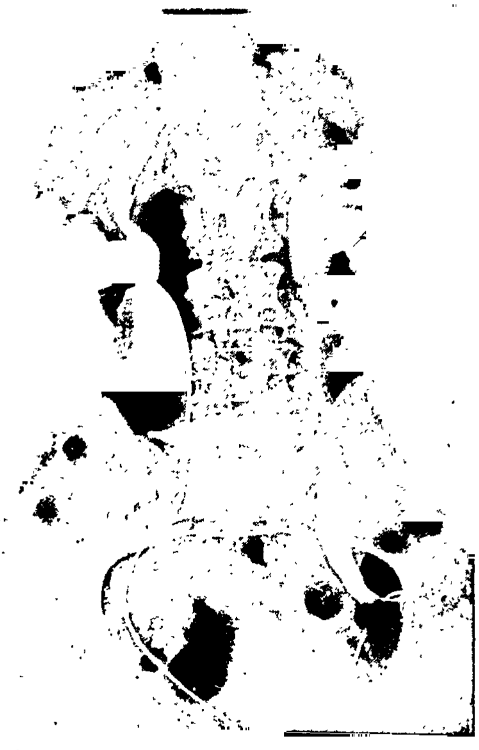


Fig. 1.—Preoperative roentgenogram of retrograde study. Note the "curlicue" of the left ureter and hydronephrosis.

She was seen by us in June, 1951. She reported five or six episodes of severe, colicky pain in the left loin radiating to the left groin in the preceding year. The episodes of pain would last three or four days. The distress was frequently associated with nausea and vomiting. Physical examination revealed severe arteriosclerosis. Although auricular fibrillation was present, there was no evidence of decompensation. Definite tenderness in the left costovertebral angle was elicited. The urine contained many pus cells, but no other abnormalities were noted in laboratory studies with the exception of moderate leukocytosis and an increased sedimentation rate. Results of pyelographic studies, both excretory and retrograde, were entirely normal. Urine culture revealed Escherichia coli. The diagnosis was left-sided pyelonephritis. With antibiotic therapy she became asymptomatic.

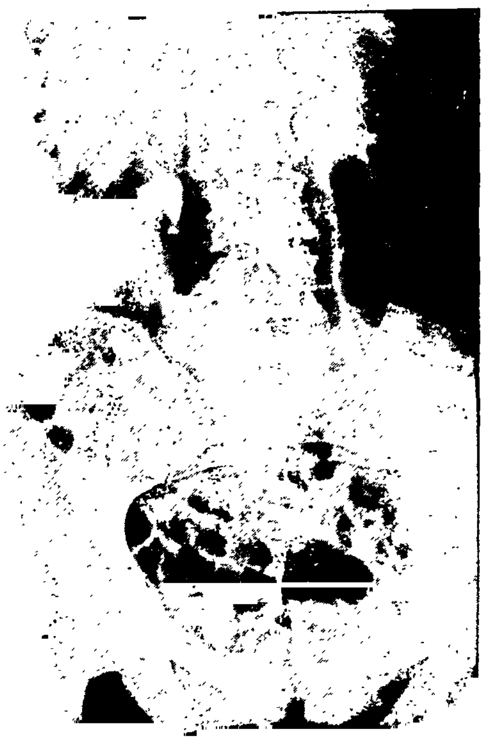


Fig. 2.—Postoperative intravenous pyelogram, showing lateral position of the ureter and normal kidney pelvis.

Four months later, the patient returned to the clinic. Her complaints were identical with those on her previous admission. She had an attack once a week, every Wednesday morning. During these episodes, the pain persisted for 24 hours and was associated with low grade fever. On each Thursday morning, the pain relented, and the patient was able to resume her usual activities. At this time, the urine was again found to contain many pus cells. Retrograde pyelography showed a tight loop in the left ureter, about 1 cm. in diameter, at about the midplane of the pelvis (fig. 1). This "curlicue" obviously produced a pronounced hydroureter and hydronephrosis from this point upward. A review of previous studies disclosed nothing that resembled the "curlicue" appearance; thus, the lesion must have been either acquired or intermittent. A preoperative diagnosis of ureteral obstruction due to an adhesion or retroperitoneal lymphatic malignant disease was entertained.

On Oct. 27, 1951, an operation was performed, and a loop of ureter was found herniated into the greater sacrosciatic foramen, above the pyriformis. There was an intimate relation with the gluteal artery, the innominate bone, and the pyriformis muscle. Above this point the ureter was considerably dilated. Below, the ureter was somewhat contracted. It was possible to reduce the hernia with its entire sac. This left an opening in the sciatic foramen that would admit the index finger for approximately 3 cm. The ureteral loop, after reduction, was seen to be covered with a sac-like membrane. When this was removed, the ureteral "curlicue" was easily straightened out, although the indwelling ureteral catheter now became kinked.

From the departments of surgery and urology at the Guthrie Clinic.

[1] Lindbom, A.: Unusual Ureteral Obstruction by Herniation of Ureter into Sciatic Foramen: Report of Case, Acta radiol. 28:225-226, 1947.

The hiatus in the sciatic foramen was repaired by filling the defect with oxycel® (absorbable hemostatic) gauze, and the base of the broad ligament was then brought over to cover this area. The ureter was sutured in a more lateral position. Postoperative studies revealed a complete reduction of the hydroureter and hydronephrosis. The ureter now lay in a much more lateral position (fig. 2).

As the patient was about to return home, she experienced moderately severe cardiac decompensation with pleural effusion. However, she responded well to treatment and was discharged from the hospital as cured.

COMMENT

The part played in the causation of this condition by the old amputation, the mal-united fracture of the left hip, and atrophy of the gluteal musculature is difficult to evaluate. This is especially true since we do not have a series of cases from which to draw conclusions. The "curlicue" appearance of the ureter illustrated in figure 1 was also seen in Lindbom's case. Its appearance is so striking that it may well represent a diagnostic sign. We have not observed it in association with any other condition.

The manner of handling the defect by the reduction of the hernia is somewhat unusual. Apparently almost any method may be used in closing the opening with successful results, as we have seen no reports of recurrent sciatic hernias when other structures were involved. The method used in this case was simple and, we hope, effective.

It is of collateral interest to note that Watson,[2] in 1946, was able to find only 35 cases of sciatic hernia in the literature. He also was able to find only 102 case histories of the presence of a ureter in a hernia.

SUMMARY

A case of ureteral herniation into the sacrosciatic foramen is reported. As far as we could determine, this is the second such case to be reported in the literature. The deformity as demonstrated by the ureterogram appears to be typical and diagnostic, and we have called it a "curlicue ureter."

[2] Watson, L. F.: Hernia, ed. 3, St. Louis, C. V. Mosby Company, 1948.

The Coroner System.—The coroner system had its origin in England in the late twelfth century and appeared in the earliest records of the American Colonies. Since that time the scope and nature of the coroner's duties have evidenced little change. There is probably no field of legal or medical activity in which progress has met with such organized and bitter opposition as that of the coroner. Despite the fact that the opinion of a coroner or the verdict of his jury may make the difference between execution and acquittal in a homicide trial or between poverty and inheritance of enough to support the surviving children of the victim of sudden death; despite the fact that these opinions are almost if not entirely medical in nature, two-thirds of the states today do not require that their coroner be a physician or have any medical training whatsoever! Truly the generations to come will have difficulty in comprehending this enigma of sanctification of ignorance!—Russell S. Fisher, M.D., The Changing Perspective in Medicolegal Practice, *The Proceedings of the Institute of Medicine of Chicago,* March 15, 1952.

COUNCIL ON PHARMACY AND CHEMISTRY

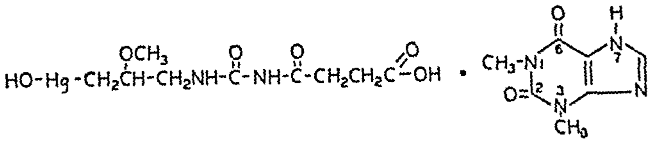
NEW AND NONOFFICIAL REMEDIES

The following additional articles have been accepted as conforming to the rules of the Council on Pharmacy and Chemistry of the American Medical Association for admission to New and Nonofficial Remedies. A copy of the rules on which the Council bases its action will be sent on application.

R. T. STORMONT, M.D., *Secretary.*

Meralluride-U.S.P. — Mercuhydrin (Lakeside). — $C_9H_{10}HgN_2O_6 \cdot C_7H_8N_4O_2$.—M.W. 629.00.—1-(3′-Hydroxymercuri-2′-methoxypropyl)-3-succinylurea and theophylline.—"Meralluride consists of methoxyoxymercuripropylsuccinylurea (the mercuric compound, $C_9H_{16}HgN_2O_6$, mol. wt. 448.84), and of theophylline in approximately molecular proportions. Meralluride, dried at 105° for 3 hours, contains not less than 94 per cent and not more than 106 per cent of the labeled amounts of the mercuri compound and of anhydrous theophylline ($C_7H_8N_4O_2$)." *U.S.P.*

The structural formula of meralluride may be represented as follows:



Actions and Uses.—Meralluride is a mercurial diuretic used for the preparation of solutions of its sodium salt for injection. The drug, as the non-reacted acid with sodium bicarbonate, is utilized for rectal administration in the form of suppositories. The latter are suitable as a supplement to parenteral injections of the sodium salt to prolong the edema-free period. Suppositories alone may control mild cases of edema. The indications and precautions are the same as for other mercurials.

Dosage.—Rectally, a suppository containing 0.6 gm. of meralluride is given daily; as a supplementary measure to parenteral administration, one suppository may be given daily beginning one to three days after injection.

Tests and Standards.—

For description and standards see the U. S. Pharmacopeia under Meralluride.

Dosage Forms of Meralluride

SUPPOSITORIES. *Identity Tests:* Shave an amount of suppositories equivalent to about 0.5 gm. of meralluride. Place the shavings in a 50 ml. round-bottomed flask, add 5 ml. of water and 3 ml. of formic acid, and reflux the mixture for 10-15 min.: a gray precipitate forms (*presence of mercury*). Decant the solution through a small filter paper and cool the filtrate in ice-water. Filter the mixture, wash the precipitate with two 5 ml. portions of ice-water, save the filtrate and washings, and dry the precipitate at 80° for 1 hour: the allylsuccinylurea obtained melts between 145 and 148°.

Heat to boiling the filtrate saved from the previous test. Pass hydrogen sulfide through it for about 10 min. Filter the mixture, cool the filtrate and transfer it to a 125 ml. separatory funnel. Add 10 gm. of sodium acetate and extract with three 10 ml. portions of chloroform. Evaporate the combined chloroform extracts nearly to dryness on a steam bath and complete the drying in a current of warm air. Suspend the residue in 5 ml. of water, heat to boiling to dissolve the residue and filter the hot solution. Cool the filtrate in an ice-bath. Remove the crystals by filtration, wash them with water and dry them at 105° for 4 hours: the theophylline melts between 270 and 275° and responds to the identity tests for theophylline, *U. S. P. XIV*, p. 621.

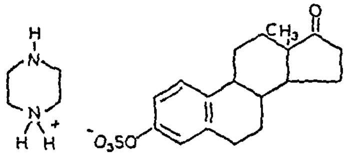
Assay: (Mercury) Transfer to a 250 ml. volumetric flask an amount of suppositories equivalent to about 3 gm. of mercury, and add 125 ml. of water and 15 ml. of 0.1 *N* sodium hydroxide. Heat the mixture carefully on a steam bath and shake the flask occasionally until all the material dissolves. If necessary, use an antifoaming agent. Cool, dilute to the mark with water and mix well. Transfer to a 250 ml. round-bottomed flask an aliquot, accurately measured, equivalent to about 40 mg. of mercury, add 30 ml. of nitric acid and reflux the mixture until it is colorless (about 3 hours). Cool the contents of the flask and quantitatively transfer them to a 400 ml. beaker. Dilute the solution to about 150 ml. with water, add 2 ml. of ferric ammonium sulfate T.S. as an indicator and titrate with 0.02 *N* ammonium thiocyanate. Each milliliter of 0.02 *N* ammonium thiocyanate is equivalent to 0.002006 gm. of mercury. The amount of mercury present is not less than 90.0 nor more than 110.0% of the labeled amount.

(Theophylline) Transfer to a 500 ml. volumetric flask an amount of suppositories equivalent to about 0.9 gm. of anhydrous theophylline. Add 250 ml. of water. Heat the mixture on a steam bath until the suppositories disintegrate. Add 25 ml. of ammonia T.S. and continue heating until all the material dissolves. If necessary, use an antifoaming agent. Cool, dilute to the mark with water and mix well. Transfer to a 250 ml. beaker an aliquot, accurately measured, equivalent to about 180 mg. of anhydrous theophylline. Add 20 ml. of 0.1 *N* silver nitrate and heat on a steam bath for 20 min. or until the precipitate coagulates. Filter the mixture through a fritted glass crucible of medium porosity. Wash the precipitate with water until the washings give no opalescence with 10% sodium chloride acidified with nitric acid. Dissolve the precipitate in 10 ml. of nitric acid, allowing the nitric acid solution to filter into a 500 ml. suction flask, at first without, and then with, a slight vacuum. Wash the crucible with hot water until the filtrate and washings approximate 150 ml. Cool the filtrate, add 2 ml. of ferric ammonium sulfate T.S. as an indicator and titrate with 0.1 *N* ammonium thiocyanate. Each milliliter of 0.1 *N* ammonium thiocyanate is equivalent to 0.01802 gm. of anhydrous theophylline. The amount of anhydrous theophylline present is not less than 90.0 nor more than 110.0% of the labeled amount.

Lakeside Laboratories, Inc., Milwaukee.

Suppositories Mercuhydrin: 0.6 gm. of meralluride (equivalent to 0.19 gm. of mercury). Buffered with 80 mg. of sodium bicarbonate.

Piperazine Estrone Sulfate.—Sulestrex Piperazine (Abbott).—$C_4H_{11}N_2.C_{18}H_{21}O_5S$.—M.W. 436.56.—Piperazine estrone sulfate marketed for use as a drug is stabilized with a small amount of free piperazine.—The structural formula of piperazine estrone sulfate may be represented as follows:



Actions and Uses.—Piperazine estrone sulfate has the same Actions and Uses as other estrogens.

Dosage.—Piperazine estrone sulfate is administered orally. For the control of menopausal symptoms, 1.5 mg. daily is usually sufficient. The dosage may be increased if the response is not satisfactory; it may be gradually reduced when the symptoms have been controlled. For the treatment of senile vaginitis, kraurosis vulvae, and pruritis vulvae, 1.5 to 4.5 mg. should be adequate. For postpartum breast engorgement, 4.5 mg. is administered at four-hour intervals for five doses.

Tests and Standards.—

Physical Properties: Piperazine estrone sulfate is a fine, white to creamy white, odorless, crystalline powder. It melts between 185 and 195° to a light brown syrup, which solidifies on further heating, and finally melts with decomposition between about 240 and 250°. It is slightly soluble in water and alcohol.

Identity Tests: Dissolve about 10 mg. of piperazine estrone sulfate in 5 ml. of water. Add 5 ml. of a solution prepared by dissolving 1 gm. of quinone in 5 ml. of glacial acetic acid and diluting up to 100 ml. with alcohol. Boil the resultant solution, then cool it and allow it to stand: a currant-red color appears (*presence of piperazine*).

To about 1 mg. of piperazine estrone sulfate add 1 ml. of a 2.5% solution of β-naphthol in sulfuric acid and heat the material for 2 min. in a boiling water bath. Cool the solution and add 1 ml. of water: an orange-yellow color appears; heat for 90 sec. in the boiling water bath: the color becomes red-orange (*presence of estrone*).

Purity Tests: Dry about 0.25 gm. of piperazine estrone sulfate, accurately weighed, at 105° for 1 hour: the loss in weight is not more than 1.0%.

Char about 0.1 gm. of piperazine estrone sulfate, accurately weighed. Cool, add a few drops of sulfuric acid to the charred mass and ignite: the amount of residue is not more than 0.1%.

Assay: (Estrone) Transfer exactly 12 mg. of piperazine estrone sulfate to a 100 ml. volumetric flask, dilute to the mark with water and shake the flask vigorously for several minutes to dissolve the material completely. Pipet a 20 ml. aliquot into a test tube and add 2 ml. of hydrochloric acid. Heat the tube in a boiling water bath for 10 min. Quantitatively transfer the contents of the tube to a 250 ml. separatory funnel, using a total of 80 ml. of rinse water. Add the washings to the separatory funnel and extract the estrone with one 35 and two 15 ml. portions of benzene. Wash the combined benzene extracts with 25 ml. of water, 2 ml. of 9% sodium bicarbonate, 15 ml. of 9% sodium carbonate, 10 ml. of water, 2 ml. of 50% sulfuric acid, and two 10 ml. portions of water. Carefully and completely withdraw the benzene to a dry 250 ml. beaker containing a small amount of anhydrous sodium sulfate and swirl until the benzene is clear. Decant the benzene into a 100 ml. volumetric flask, excluding the sodium sulfate. Rinse the beaker with several small portions of benzene and add them to the volumetric flask. Fill to the mark with benzene and mix thoroughly. Transfer a 2 ml. aliquot of this solution to a test tube.

Prepare an estrone standard containing 25 γ per ml. of estrone in alcohol. Transfer a 1 ml. aliquot of estrone standard to a test tube. Evaporate the sample and standard to dryness on a steam bath with the aid of a current of air. Cool the tubes in an ice-bath.

Redistil phenol into a glass-stoppered flask, discarding the first 10% and the last 5% of the distillate. Add to the phenol 1.55 times its weight of sulfuric acid, mix thoroughly, and cool. Add 3 ml. of the reagent to the standard, the sample, and a blank; and stopper the tubes and place them in a boiling water bath for 20 min., shaking the tubes 4 times during the heating period. Transfer the tubes to an ice-bath for 5 min., then remove them and add 3 ml. of water. Stir the contents with a glass rod until thoroughly mixed. Leave the glass rods in the tubes until the color development is completed. Place the tubes in the boiling water bath for 3 min., and then remove them to the ice-bath for 5 min. Add 9 ml. of 5% sulfuric acid to the tubes and mix thoroughly. Determine the optical absorbancies of the sample and standard relative to the blank at 5220 Å. The amount of estrone present is not less than 56.0 nor more than 63.0%, equivalent to not less than 90.4 nor more than 101.7% of piperazine estrone sulfate.

(*Nitrogen*) Transfer about 0.1 gm. of piperazine estrone sulfate, accurately weighed, to a semi-micro Kjeldahl flask, and digest it with 7 ml. of sulfuric acid, 2.7 gm. of potassium sulfate and 0.3 gm. of mercuric oxide for 4 hours. Dilute the clear solution to 15 ml. with water, make it alkaline with 40% sodium hydroxide and then add 10 ml. of 40% sodium thiosulfate. Distil the ammonia into 20 ml. of 4% boric acid. Using a mixed indicator (1:5 methyl red T.S. and bromocresol green T.S.), titrate the ammonia liberated with 0.05 *N* sulfuric acid. Each milliliter of 0.05 *N* acid is equivalent to 0.0007004 gm. of nitrogen. The amount of nitrogen present is not less than 6.4 nor more than 7.0%.

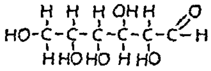
Dosage Forms of Piperazine Estrone Sulfate

TABLETS. *Assay:* Grind 25 tablets to a fine powder. Transfer to a glass-stoppered 250 ml. Erlenmeyer flask a sample of the powder, accurately weighed, equivalent to 12 mg. of piperazine estrone sulfate. Add exactly 100 ml. of water and place the flask in a shaking machine for 1 hour. Filter the solution through Whatman No. 1 or equivalent filter paper (paper which retains medium-sized particles), discarding the first portion of the filtrate. Transfer to a test tube exactly 20 ml. of the filtrate and proceed as directed in the assay for estrone in the monograph for Piperazine Estrone Sulfate starting with, ". . . and add 2 ml. of hydrochloric acid . . ." The amount of piperazine estrone sulfate present is not less than 90.0 nor more than 110.0% of the labeled amount.

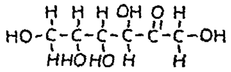
Abbott Laboratories, North Chicago, Ill.

Tablets Sulestrex Piperazine: 0.75 mg., 1.5 mg., and 3 mg. U. S. Trademark 505,252.

Invert Sugar.—Travert (Baxter).—Invert sugar is an equimolecular mixture of dextrose and levulose prepared by the inversion of aqueous solutions of sucrose. The structural formulas of dextrose and levulose may be represented as follows:



$$HO-\underset{H}{\overset{H}{C}}-\underset{HO}{\overset{H}{C}}-\underset{HO}{\overset{H}{C}}-\underset{H}{\overset{OH}{C}}-\underset{HO}{\overset{H}{C}}-\overset{O}{\overset{/\!/}{C}}-H$$



$$HO-\underset{H}{\overset{H}{C}}-\underset{HO}{\overset{H}{C}}-\underset{HO}{\overset{H}{C}}-\underset{H}{\overset{OH}{C}}-\overset{O}{\overset{\|}{C}}-\underset{H}{\overset{H}{C}}-OH$$

Actions and Uses.—Invert sugar, a mixture of equal parts of dextrose (ᴅ-glucose) and levulose (ᴅ-fructose), is used in place of dextrose for parenteral carbohydrate alimentation. Its caloric value, gram for gram, is identical with that of dextrose. Evidence, however, indicates that invert sugar is more rapidly utilized than dextrose. The rapidity with which invert sugar is utilized is probably caused by a more rapid utilization rate of the fructose portion and further influence of the fructose upon the glucose portion. Clinical studies indicate that intravenous infusions of 50 gm. of invert sugar may be given approximately twice as fast as the same amount of dextrose without producing glycosuria. With infusion of larger amounts at this faster rate, the loss of sugar in the urine from invert sugar is only about one-tenth that which occurs from dextrose. This makes it possible to supply more nearly the carbohydrate requirements of patients who need parenteral alimentation.

Dosage.—Invert sugar for parenteral carbohydrate alimentation may be administered intravenously, subfascially, or subcutaneously. Preparations containing 5% or 10% in either water or isotonic sodium chloride solution are suitable for this purpose and do not subject patients to the discomfort usually accompanying the subcutaneous or subfascial administration of corresponding concentrations of dextrose. One liter of 10% invert sugar supplies approximately 400 calories and can be administered in the same time required for an equal quantity of 5%

dextrose which supplies approximately 200 calories. Usual precautions taken with other forms of parenteral alimentation should be observed when administering invert sugar.

Tests and Standards.—

Invert sugar is prepared in the form of a concentrated solution which responds to the following tests and standards.

Physical Properties: Invert sugar solutions are clear and colorless. The specific rotation, [α]25,D, of a 16% solution is between —17.0 and —19.5°. The solutions have a pH of 3.5-6.0.

Identity Tests: To 5 ml. of hot alkaline cupric tartrate T.S. add a few drops of a 5% solution of invert sugar: a red precipitate of cuprous oxide appears *(presence of reducing sugars).*

Prepare a 0.05% solution of resorcinol in hydrochloric acid diluted 1:1. To 5 ml. of the solution add 1 ml. of a 4% solution of invert sugar and heat in a boiling water bath for 2 min.: a red-orange color appears *(presence of ketohexose).*

Prepare a solution containing 1 gm. of phenylhydrazine hydrochloride and 1.5 gm. of sodium acetate in 10 ml. of water by heating the mixture to about 60°, cooling, and then filtering. To 5 ml. of this solution in a test tube add 3 ml. of a 5% solution of invert sugar. Place the test tube in a boiling water bath for about 10 min. Crystals begin to appear in 3-5 min. Cool the reaction mixture, filter it, and wash the precipitate with three 10 ml. portions of water followed by single washings with 5 ml. of alcohol and 5 ml. of ether. Dry the residue at 105° for 30 min.: the yellow osazone formed melts at 205-210°.

Purity Tests: To a volume of solution containing 1 gm. of invert sugar add 1 ml. of ammonium oxalate T.S.: the solution remains clear for 1 min. *(absence of calcium).*

To 50 ml. of solution containing 10 gm. of invert sugar add 2 ml. of nitric acid and exactly 10 ml. of 0.02 *N* silver nitrate. Heat the mixture on a steam bath to coagulate the silver chloride, cool, and add 5 ml. of nitrobenzene and 2 ml. of ferric ammonium sulfate T.S. Titrate the excess silver nitrate with 0.02 *N* ammonium thiocyanate. Each milliliter of 0.02 *N* silver nitrate consumed is equivalent to 0.0007092 gm. of chloride: no more than 0.025% W/V of chloride is present.

To 20 ml. of a solution containing 5 gm. of invert sugar add 1 ml. of diluted hydrochloric acid and 2 ml. of barium chloride T.S.: the turbidity produced is no greater than that from 0.3 ml. of 0.02 *N* sulfuric acid treated in the same manner, corresponding to not more than 60 ppm of sulfate.

Transfer to a test tube a portion of solution containing 1 gm. of invert sugar. Add 5 ml. of ether and shake vigorously. Separate the layers, transfer 2 ml. of the ether layer to a test tube, and add 1 ml. of a 1% solution of resorcinol in hydrochloric acid: no cherry-red color appears immediately (*absence of hydroxymethylfurfural*).

Transfer to a tared crucible a volume of solution containing the equivalent of 3 gm. of invert sugar and remove the water by evaporation on a steam bath. Char the residue, cool, add 1 ml. of concentrated sulfuric acid, and continue ignition until no carbon remains: the amount of residue is not more than 0.05%. Save this residue for the heavy metals test.

Proceed with the residue from the ashing as directed in the heavy metals test for dextrose in *U.S.P. XIV*, p. 167, starting with, ". . . add a mixture of 30 cc. of diluted hydrochloric acid . . ." The heavy metals limit is 5 ppm.

Assay: (Invert Sugar) Prepare a 1% solution of invert sugar and using 20 ml. of this solution assay for invert sugar as directed in *Official Methods of Analysis of the Association of Official Agricultural Chemists,* ed. 7, A.O.A.C., Washington, 1950, p. 506-507, par. 29.35-29.37. The solution is not less than 95.0 nor more than 105.0% of the labeled amount.

(Sucrose) Transfer to a 100 ml. volumetric flask 40 ml. of the 1% solution of invert sugar prepared for the assay for invert sugar. Add 20 ml. of water and 8 ml. of 21% hydrochloric acid. Heat a water bath to 70° and regulate the heat input so that the temperature of the bath remains about at that point. Place the flask in the bath and after the solution reaches 67°, leave the flask in the bath exactly 5 min. longer, during which time the temperature of the solution gradually rises to 69.5°. Cool in water to about 20°, neutralize the solution with sodium hydroxide T.S., using methyl red T.S. as an indicator, and fill to volume. Using 50 ml. of the solution, assay for invert sugar as previously directed. The percentage of sucrose equals 0.95(A-B), where A and B are percentages of invert sugar after and before inversion, respectively. The amount of sucrose present is not more than 2.0%.

Dosage Forms of Invert Sugar

The dosage forms are prepared by appropriate dilution of the concentrated invert sugar solution.

SOLUTIONS. *Identity Tests:* The solutions respond to the identity tests listed in the monograph for Invert Sugar.

Assay: The solutions respond to the assay method for invert sugar described in the monograph on Invert Sugar. The amount of invert sugar present is not less than 95.0 nor more than 105.0% of the labeled amount.

Baxter Laboratories, Inc., Morton Grove, Ill.

Solution Travert 5% in Water (or Saline): 150 cc. and 1 liter bottles. A solution in water or isotonic sodium chloride containing 50 mg. of invert sugar in each cubic centimeter.

Solution Travert 10% in Water (or Saline): 150 cc. and 1 liter bottles. A solution in water or isotonic sodium chloride containing 0.1 gm. of invert sugar in each cubic centimeter. U. S. Trademark 534,117.

Tyrothricin-U.S.P. (See New and Nonofficial Remedies 1951, p. 44).

Sharp & Dohme, Inc., Glenolden, Pa.

Solution Soluthricin 0.05%: 240 cc. bottles. A solution in 1% alcohol, propylene glycol, and water containing 0.5 mg. each of tyrothricin and cetyldimethylethylammonium bromide in each cubic centimeter.

Solution Soluthricin (Concentrate) 2.5%: 10 cc. and 20 cc. vials. A solution in 50% alcohol and propylene glycol containing 25 mg. each of tyrothricin and cetyldimethylethylammonium bromide in each cubic centimeter. U. S. Trademark 421,710.

Phenobarbital Sodium-U.S.P. (See New and Nonofficial Remedies 1951, p. 248).

Winthrop-Stearns, Inc., New York.

Solution Luminal Sodium in Propylene Glycol: 2 cc. Ampins. A solution in propylene glycol, containing 0.16 gm. of phenobarbital sodium in each cubic centimeter. The solution may be administered intramuscularly or subcutaneously, but not intravenously. U. S. Trademark 87,327.

Progesterone-U.S.P. (See New and Nonofficial Remedies 1951, p. 361).

Kremers-Urban Company, Milwaukee.

Solution Progesterone in Oil with Benzyl Alcohol 5%: 10 cc. vials. A solution in sesame oil containing 25 mg. of progesterone in each cubic centimeter.

Tubocurarine Chloride-U.S.P. (See New and Nonofficial Remedies 1951, p. 163).

E. R. Squibb & Sons, New York.

Suspension Tubocurarine Chloride in Oil with Myricin: 5 cc. vials. A suspension in peanut oil containing 27 mg. of tubocurarine chloride and 48 mg. of myricin in each cubic centimeter.

Zincundecate (See New and Nonofficial Remedies 1951, page 49).

Veltex Company, Birmingham, Ala.

Ointment Undesol: 30 gm., 60 gm., 454 gm., and 2270 gm. jars. An ointment containing 0.2 gm. of zinc undecylenate and 50 mg. of undecylenic acid in each gram.

Amphetamine Sulfate-U.S.P. (See New and Nonofficial Remedies 1951, p. 188).

Gold Leaf Pharmacal Company, Inc., New Rochelle, N. Y.

Tablets Amphetamine Sulfate: 5 mg. and 10 mg.

Ascorbic Acid-U.S.P. (See New and Nonofficial Remedies 1951, p. 429).

Physicians' Drug & Supply Company, Philadelphia

Tablets Ascorbic Acid: 25 mg., 50 mg., and 100 mg.

Chorionic Gonadotropin (See New and Nonofficial Remedies 1951, p. 359).

Sharp & Dohme, Inc., Glenolden, Pa.

Lyovac Chorionic Gonadotropin: 10 cc. vials. A powdered preparation of chorionic gonadotropin which, when diluted with the accompanying 10 cc. of sterile distilled water containing 0.35% phenol, provides a solution having a potency of 500 I.U. in each centimeter.

CORRECTION

Balarsen.—In the list of new generic and brand names in THE JOURNAL, May 3, 1952, page 63, Balarsen was erroneously spelled Balarsan.

MEDICAL LICENSURE STATISTICS FOR 1951

FIFTIETH ANNUAL PRESENTATION OF LICENSURE STATISTICS BY THE COUNCIL ON MEDICAL EDUCATION AND HOSPITALS OF THE AMERICAN MEDICAL ASSOCIATION

Donald G. Anderson, M.D., Secretary, and Anne Tipner

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This report is the 50th annual compilation of information and statistics pertaining to medical licensure in the United States and its territories and outlying possessions by the Council on Medical Education and Hospitals of the American Medical Association.

The report presents statistics for the medical examining boards of all the states, the District of Columbia, Alaska, Hawaii, Puerto Rico, Guam, the Virgin Islands, and the Canal Zone. The figures for Arkansas, Connecticut, and Maryland also include data reported by the homopathic medical examining boards of those states.

As in previous years, there is included data pertaining to the National Board of Medical Examiners and the 21 boards of examiners in the basic sciences.

The compilations included in this study were obtained from official reports. The Council and THE JOURNAL express their appreciation to the officers of the examining and licensing agencies for these data and for other records furnished throughout the year to the office of the Council.

The tables referring to medical licensure include figures for the number of candidates examined for medical licensure in 1951 and also for those licensed on the basis of reciprocity or endorsement of credentials. There are also included other data pertaining to the regulations for medical licensure both of physicians who secured their professional training in the United States and Canada and of physicians educated in other countries. The state boards are discussed first, followed by the basic science boards and the National Board of Medical Examiners.

STATE BOARDS OF MEDICAL EXAMINERS

Licenses Issued

During the year 1951 there were 12,008 licenses to practice medicine issued by the medical examining boards of the 48 states, the District of Columbia, Alaska, Hawaii, Puerto Rico, Guam, the Virgin Islands, and the Canal Zone. The number licensed in each state, by examination or by the endorsement of credentials, is shown in table 1. Of the 12,008 licenses issued, 5,713 were granted after written examination and 6,295 by reciprocity or endorsement of state licenses or the certificate of the National Board of Medical Examiners.

TABLE 1.—*Licenses Issued, 1951*

	Examination	On the Basis of Reciprocity and Endorsement	Total
Alabama	69	59	128
Arizona	14	60	74
Arkansas	83	46	129
California	523	844	1,367
Colorado	84	84	168
Connecticut	33	195	228
Delaware	13	15	28
District of Columbia	27	139	166
Florida	329	0	329
Georgia	146	80	226
Idaho	8	35	43
Illinois	462	203	665
Indiana	113	125	238
Iowa	77	85	162
Kansas	92	93	185
Kentucky	101	82	183
Louisiana	218	85	303
Maine	15	30	45
Maryland	176	122	298
Massachusetts	35	264	299
Michigan	203	214	417
Minnesota	166	134	300
Mississippi	77	53	130
Missouri	228	128	356
Montana	3	38	41
Nebraska	96	33	129
Nevada	0	13	13
New Hampshire	6	41	47
New Jersey	54	275	329
New Mexico	0	54	54
New York	336	771	1,107
North Carolina	125	113	238
North Dakota	26	16	42
Ohio	352	312	664
Oklahoma	75	53	128
Oregon	42	75	117
Pennsylvania	277	272	549
Rhode Island	12	28	40
South Carolina	63	55	118
South Dakota	21	25	46
Tennessee	174	79	253
Texas	307	325	632
Utah	27	37	64
Vermont	2	13	15
Virginia	168	123	291
Washington	52	136	188
West Virginia	26	73	99
Wisconsin	129	87	216
Wyoming	4	23	27
Alaska, Canal Zone, Guam, Hawaii, Puerto Rico, and the Virgin Islands	44	50	94
Totals	5,713	6,295	12,008

TABLE 2.—CANDIDATES EXAMINED

Marginal Number	SCHOOL	1 Alabama		2 Arizona		3 Arkansas		4 California		5 Colorado		6 Connecticut		7 Delaware		8 Dist. of Columbia		9 Florida		10 Georgia		11 Idaho		12 Illinois		13 Indiana		14 Iowa		15 Kansas		16 Kentucky		17 Louisiana		18 Maine		19 Maryland		20 Massachusetts		21 Michigan	
		P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F
	ALABAMA																																										
1	Medical College of Alabama, Birmingham	53	2															5	2	2	0																						
	ARKANSAS																																										
2	University of Arkansas School of Medicine, Little Rock					81	4											4	0																								
	CALIFORNIA																																										
3	University of California School of Medicine, San Francisco							71	1															1	0									1	0					1	0		
4	Coll. of Medical Evangelists, Loma Linda-Los Angeles							67	2	6	0					1	0	3	0					1	0							1	0					2	0			1	0
5	Univ. of So. California School of Med., Los Angeles							57	0									1	0					0	1															0	1		
6	Stanford University School of Medicine, Stanford University-San Francisco							59	2																													1	0				
	COLORADO																																										
7	University of Colorado School of Medicine, Denver			2	0			0	1	53	0							1	0											1	0												
	CONNECTICUT																																										
8	Yale University School of Medicine, New Haven											1	0	1	0			3	0																								
	DISTRICT OF COLUMBIA																																										
9	Georgetown University School of Med., Washington	1	0					1	0							1	0	2	0																								
10	George Washington Univ. School of Med., Washington																	8	1					1	0																		
11	Howard University College of Medicine, Washington	1	0					5	1							10	0	1	0					2	2									2	0			8	0			1	0
	GEORGIA																																										
12	Medical College of Georgia, Augusta																	15	3	74	0																						
13	Emory University School of Medicine, Atlanta																	21	0	69	0																						
	ILLINOIS																																										
14	Chicago Medical School							1	0			1	0					3	0					19	0									2	0							1	0
15	Northwestern University Medical School, Chicago	1	0	1	0			10	0									8	1			1	0	75	1	3	0			2	0	1	0					1	0	2	0	13	0
16	Stritch School of Med. of Loyola University, Chicago			1	0			3	0	2	0	2	0					6	0					39	1	1	0					2	0	2	0							3	0
17	University of Chicago, The School of Medicine							3	0													1	0	16	0	3	0															2	0
18	University of Illinois College of Medicine, Chicago			1	0			18	2							1	0	7	2					113	1	1	0	1	0					1	0			1	0			1	0
	INDIANA																																										
19	Indiana University School of Medicine, Bloomington-Indianapolis					1	0	2	0									8	3					3	0	100	2													1	0		
	IOWA																																										
20	State University of Iowa College of Med., Iowa City							3	0									0	1					1	0			62	0					1	0							2	0
	KANSAS																																										
21	Univ. of Kansas School of Med., Lawrence-Kansas City																	2	1					2	0					83	0												
	KENTUCKY																																										
22	University of Louisville School of Medicine																	5	2					1	0							90	0										
	LOUISIANA																																										
23	Louisiana State Univ. School of Med., New Orleans							1	0									4	0															86	0								
24	Tulane University of Louisiana School of Medicine, New Orleans							3	0	1	0							17	1															104	0								
	MARYLAND																																										
25	Johns Hopkins University School of Med., Baltimore							2	0					1	0	1	0	5	0																			55	0				
26	University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore							1	0			1	0					5	0					2	0					1	0			1	0			71	0				
	MASSACHUSETTS																																										
27	Boston University School of Medicine							1	0									2	0																								
28	Harvard Medical School, Boston							3	0									7	0					2	0							1	0	2	0	1	0			4	0		
29	Tufts College Medical School, Boston																	6	2	1	0			2	0											3	0			1	0		
	MICHIGAN																																										
30	University of Michigan Medical School, Ann Arbor							6	0									9	2					1	0															3	0	104	0
31	Wayne University College of Medicine, Detroit							1	0	1	0							5	1																							57	0
	MINNESOTA																																										
32	University of Minnesota Medical School, Minneapolis							5	0							1	0	1	0					2	0													2	0			8	
	MISSOURI																																										
33	St. Louis University School of Medicine							5	0									7	0					4	0					1	0									1	0	[illegible]	
34	Washington University School of Medicine, St. Louis			1	0			6	0									4	1					2	0									1	0								
	NEBRASKA																																										
35	Creighton University School of Medicine, Omaha							11	1	3	0	0	1															13	0	1	0									1	0	[illegible]	
36	University of Nebraska College of Medicine, Omaha							1	0															1	0																	1	0
	NEW YORK																																										
37	Albany Medical College																	3	0																								
38	State University of New York, College of Medicine at New York City							2	0			1	0					6	2	1	0																	1	0	1	0		
39	University of Buffalo School of Medicine																	4	0																					0	1		
40	Columbia University College of Physicians and Surgeons, New York											1	0			1	0	7	1																	1	0					1	0
41	Cornell University Medical College, New York							2	0							1	0	3	1					1	0															1	0	2	0
42	New York Medical College, Flower and Fifth Avenue Hospitals, New York											1	0	1	0			4	0																	1	0						
43	New York University College of Medicine, New York							1	0									14	0											1	0							1	0	1	0		
44	Univ. of Rochester School of Medicine and Dentistry							3	0					1	0	1	0	1	0															2	0			2	0			1	0
45	State University of New York at Syracuse College of Medicine							2	0							1	0																	1	0			1	0			1	0
	NORTH CAROLINA																																										
46	Duke University School of Medicine, Durham			1	0													14	0													1	0	1	0							1	0
47	Bowman Gray School of Medicine of Wake Forest College, Winston-Salem							1	0									3	0																								
		1		2		3		4		5		6		7		8		9		10		11		12		13		14		15		16		17		18		19		20		21	

23 Mississippi		24 Missouri		25 Montana		26 Nebraska		27 Nevada		28 New Hampshire		29 New Jersey		30 New Mexico		31 New York		32 North Carolina		33 North Dakota		34 Ohio		35 Oklahoma		36 Oregon		37 Pennsylvania		38 Rhode Island		39 South Carolina		40 South Dakota		41 Tennessee		42 Texas		43 Utah		44 Vermont		45 Virginia		46 Washington		47 West Virginia		48 Wisconsin		49 Wyoming		50 Alaska, Hawaii, Puerto Rico and Virgin Islands		Totals	Examined—Passed	Examined—Failed	Percentage—Failed	No. Boards Examined by	Marginal Number
P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F						
																				2	0																																			66	62	4	6.1	4	1
																2	0																																	1	0			1	0	93	89	4	4.3	5	2
																				2	0																																	2	0	79	78	1	1.3	6	3
																1	1															1	0			2	0	1	0							1	0									91	88	3	3.3	13	4
																																																								60	58	2	3.3	4	5
																																																								62	60	2	3.2	2	6
																																						1	0													1	0			60	59	1	1.7	7	7
												1	0									1	0					1	0																											8	8	0	0.0	6	8
																2	0																					1	0																	12	12	0	0.0	7	9
																		2	0			1	0					1	0									1	0													1	0			16	15	1	6.3	7	10
1	0	4	0									2	1			4	2	12	0									2	0																											61	55	6	9.8	14	11
																																																								92	89	3	3.3	2	12
2	0															2	1	3	0																																					89	88	1	1.1	5	13
												2	0			8	5					2	0					4	0																											48	43	5	10.4	10	14
4	0	1	0													1	1			1	0	3	0			3	0											3	0							8	0			4	0					155	152	3	1.9	22	15
		1	0													0	3					10	0					3	0					2	0																			1	0	82	78	4	4.9	16	16
														1	0	1	1	1	0			3	0			1	0											1	0	1	0					3	0			1	0					44	43	1	2.3	15	17
2	0	3	0													1	0									2	0							1	0											2	0			5	0	1	0	2	0	175	170	5	2.9	20	18
2	0																																					2	0											1	0					125	120	5	4.0	9	19
		3	0																			3	0											2	0			1	0											2	0					81	80	1	1.2	11	20
																										1	0																							2	0					94	93	1	1.1	6	21
																1	0											1	0																			1	0					1	0	104	102	2	1.9	8	22
7	0																	2	0			1	0																																	101	101	0	0.0	6	23
16	0																																																					5	0	147	146	1	0.7	6	24
2	0															2	0	2	0																			1	0											1	0					74	74	0	0.0	11	25
						1	0					1	1					6	0							1	0																													92	91	1	1.1	11	26
																												1	0									1	0																	1	0	6	6	0	0.0	5	27
3	0															1	0	7	0			1	0			1	0											3	0							2	0							1	0	39	39	0	0.0	15	28
																														1	0							1	0											1	0					18	16	2	11.1	8	29
										1	0							1	0																																					127	125	2	1.6	7	30
										1	0																																													66	65	1	1.5	5	31
1	0																			4	0													1	0			1	0	2	0					2	0									108	108	0	0.0	12	32
1	0	102	0									1	0															2	1																											126	125	1	0.8	10	33
		94	0													4	1	1	0																	1	0																			116	114	2	1.7	9	34
		1	0			22	2			0	1					1	0					1	0											3	0											2	0			1	0			1	0	69	64	5	7.2	16	35
		1	0			72	4									1	1																	4	0																			1	0	87	82	5	5.7	8	36
																1	1																																							5	4	1	20.0	2	37
												3	0			6	5											1	0																									1	0	30	23	7	23.3	10	38
																																						2	0																	7	6	1	14.3	3	39
												2	0			3	0	1	0									2	0									1	0									2	0	1	0					26	25	1	3.9	13	40
2	0									1	0					10	2											2	0									1	0							1	0									31	28	3	9.7	13	41
												2	0			6	0					1	0							1	0							1	0																	18	18	0	0.0	9	42
																6	3																	1	0			1	0																	29	26	3	10.3	8	43
																2	2	1	0			3	0					2	0									1	0	1	0									1	0	1	0			25	23	2	8.0	15	44
										1	0	1	0			1	2			1	0																	1	0															1	0	14	12	2	14.3	11	45
1	0			1	0													2	0													2	0					2	0									1	0							27	27	0	0.0	11	46
2	0			1	0													54	1	1	0																																	1	0	64	63	1	1.6	7	47
23		24		25		26		27		28		29		30		31		32		33		34		35		36		37		38		39		40		41		42		43		44		45		46		47		48		49		50							

TABLE 2.—CANDIDATES EXAMINED BY

Marginal Number	SCHOOL	1 Alabama		2 Arizona		3 Arkansas		4 California		5 Colorado		6 Connecticut		7 Delaware		8 Dist. of Columbia		9 Florida		10 Georgia		11 Idaho		12 Illinois		13 Indiana		14 Iowa		15 Kansas		16 Kentucky		17 Louisiana		18 Maine		19 Maryland		20 Massachusetts		21 Michigan		22 Minnesota	
		P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F
	ALABAMA																																												
1	Medical College of Alabama, Birmingham	53	2															5	2	2	0																								
	ARKANSAS																																												
2	University of Arkansas School of Medicine, Little Rock					81	4											4	0																												
	CALIFORNIA																																												
3	University of California School of Medicine, San Francisco							71	1															1	0									1	0					1	0				
4	Coll. of Medical Evangelists, Loma Linda-Los Angeles							67	2	6	0					1	0	3	0					1	0							1	0					2	0			1	0		
5	Univ. of So. California School of Med., Los Angeles							57	0									1	0					0	1															0	1				
6	Stanford University School of Medicine, Stanford University-San Francisco							59	2																													1	0						
	COLORADO																																												
7	University of Colorado School of Medicine, Denver			2	0			0	1	53	0							1	0											1	0														
	CONNECTICUT																																												
8	Yale University School of Medicine, New Haven											1	0	1	0			3	0																										
	DISTRICT OF COLUMBIA																																												
9	Georgetown University School of Med., Washington	1	0					1	0							1	0	2	0																										
10	George Washington Univ. School of Med., Washington																	8	1					1	0																			4	0
11	Howard University College of Medicine, Washington	1	0					5	1							10	0	1	0					2	2									2	0			8	0			1	0		
	GEORGIA																																												
12	Medical College of Georgia, Augusta																	15	3	74	0																								
13	Emory University School of Medicine, Atlanta																	21	0	69	0																								
	ILLINOIS																																												
14	Chicago Medical School							1	0			1	0					3	0					19	0									2	0							1	0		
15	Northwestern University Medical School, Chicago	1	0	1	0			10	0									8	1			1	0	75	1	3	0			2	0	1	0					1	0	2	0	13	0	6	0
16	Stritch School of Med. of Loyola University, Chicago			1	0			3	0	2	0	2	0					6	0					39	1	1	0					2	0	2	0							3	0		
17	University of Chicago, The School of Medicine							3	0													1	0	16	0	3	0															2	0	5	0
18	University of Illinois College of Medicine, Chicago			1	0			18	2							1	0	7	2					113	1	1	0	1	0					1	0			1	0			1	0	6	0
	INDIANA																																												
19	Indiana University School of Medicine, Bloomington-Indianapolis					1	0	2	0									8	3					3	0	100	2													1	0				
	IOWA																																												
20	State University of Iowa College of Med., Iowa City							3	0									0	1					1	0			62	0					1	0							2	0		
	KANSAS																																												
21	Univ. of Kansas School of Med., Lawrence-Kansas City																	2	1					2	0					83	0													3	0
	KENTUCKY																																												
22	University of Louisville School of Medicine																	5	2					1	0							90	0											2	0
	LOUISIANA																																												
23	Louisiana State Univ. School of Med., New Orleans							1	0									4	0															86	0										
24	Tulane University of Louisiana School of Medicine, New Orleans							3	0	1	0							17	1															104	0										
	MARYLAND																																												
25	Johns Hopkins University School of Med., Baltimore							2	0					1	0	1	0	5	0																			55	0					2	0
26	University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore							1	0			1	0					5	0					2	0					1	0			1	0			71	0						
	MASSACHUSETTS																																												
27	Boston University School of Medicine							1	0									2	0																										
28	Harvard Medical School, Boston							3	0									7	0					2	0							1	0	2	0	1	0			4	0				
29	Tufts College Medical School, Boston																	6	2	1	0			2	0											3	0			1	0				
	MICHIGAN																																												
30	University of Michigan Medical School, Ann Arbor							6	0									9	2					1	0															3	0	101	0		
31	Wayne University College of Medicine, Detroit							1	0	1	0							5	1																							57	0		
	MINNESOTA																																												
32	University of Minnesota Medical School, Minneapolis							5	0							1	0	1	0					2	0													2	0					86	0
	MISSOURI																																												
33	St. Louis University School of Medicine							5	0									7	0					4	0					1	0									1	0			1	0
34	Washington University School of Medicine, St. Louis			1	0			6	0									4	1					2	0									1	0										
	NEBRASKA																																												
35	Creighton University School of Medicine, Omaha							11	1	3	0	0	1															13	0	1	0									1	0			3	0
36	University of Nebraska College of Medicine, Omaha							1	0															1	0																	1	0		
	NEW YORK																																												
37	Albany Medical College																	3	0																										
38	State University of New York, College of Medicine at New York City							2	0			1	0					6	2	1	0																	1	0	1	0				
39	University of Buffalo School of Medicine																	4	0																					0	1				
40	Columbia University College of Physicians and Surgeons, New York											1	0			1	0	7	1																	1	0					1	0	2	0
41	Cornell University Medical College, New York							2	0							1	0	3	1					1	0															1	0	2	0	1	0
42	New York Medical College, Flower and Fifth Avenue Hospitals, New York											1	0	1	0			4	0																	1	0								
43	New York University College of Medicine, New York							1	0									14	0											1	0							1	0	1	0				
44	Univ. of Rochester School of Medicine and Dentistry							3	0					1	0	1	0	1	0															2	0			2	0			1	0		
45	State University of New York at Syracuse College of Medicine							2	0							1	0																	1	0			1	0			1	0		
	NORTH CAROLINA																																												
46	Duke University School of Medicine, Durham			1	0													14	0													1	0	1	0							1	0		
47	Bowman Gray School of Medicine of Wake Forest College, Winston-Salem							1	0									3	0																										
		1		2		3		4		5		6		7		8		9		10		11		12		13		14		15		16		17		18		19		20		21		22	

MEDICAL LICENSING BOARDS, 1951—Continued

23 Mississippi		24 Missouri		25 Montana		26 Nebraska		27 Nevada		28 New Hampshire		29 New Jersey		30 New Mexico		31 New York		32 North Carolina		33 North Dakota		34 Ohio		35 Oklahoma		36 Oregon		37 Pennsylvania		38 Rhode Island		39 South Carolina		40 South Dakota		41 Tennessee		42 Texas		43 Utah		44 Vermont		45 Virginia		46 Washington		47 West Virginia		48 Wisconsin		49 Wyoming		50 Alaska, Hawaii, Puerto Rico and Virgin Islands		Totals	Examined—Passed	Examined—Failed	Percentage—Failed	No. Boards Examined by	Marginal Number
P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F						
..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	1	0	..	..	..	..	83	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	101	99	2	2.0	8	48
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	0	2	0	..	..	69	0	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	1	0	80	80	0	0.0	9	49
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	73	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	82	82	0	0.0	2	50
..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	64	0	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	72	72	0	0.0	6	51
..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	1	0	..	..	..	..	..	..	..	..	27	0	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	6	0	..	..	..	..	..	..	1	0	57	57	0	0.0	13	52
..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	1	1	..	..	..	..	1	0	..	..	..	..	10	0	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4	0	29	27	2	6.9	12	53
..	..	..	..	..	..	..	..	..	..	..	..	15	0	..	..	4	3	2	0	..	..	3	0	..	..	1	0	83	0	2	0	..	..	..	..	..	..	..	..	1	0	..	..	1	0	..	..	2	0	..	..	..	..	1	1	145	138	7	4.8	21	54
..	..	..	..	..	..	..	..	..	..	..	..	5	0	..	..	2	0	1	0	2	0	1	0	..	..	..	..	28	0	..	..	..	..	2	0	..	..	1	0	..	..	..	..	..	..	..	..	..	..	1	0	..	..	5	0	73	73	0	0.0	21	55
..	..	1	0	..	..	..	..	..	..	..	..	5	0	..	..	1	0	13	0	..	..	1	0	..	..	..	..	61	0	..	..	..	..	..	..	..	..	1	0	1	0	..	..	2	0	..	..	1	0	2	0	..	..	1	0	112	112	0	0.0	21	56
2	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	0	..	..	..	..	..	..	..	..	..	..	6	0	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	15	15	0	0.0	7	57
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	2	0	..	..	1	0	54	0	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	68	66	2	2.9	8	58
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	1	0	..	..	..	..	..	..	..	..	57	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	67	65	2	3.0	6	59
17	0	1	0	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	103	0	1	0	..	..	..	..	1	0	..	..	..	..	..	..	..	..	1	0	151	147	4	2.6	11	60
2	0	2	0	..	..	..	..	..	..	..	..	..	..	..	..	3	3	3	0	..	..	..	..	..	..	..	..	1	0	..	..	1	0	..	..	7	0	1	1	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	50	45	5	10.0	17	61
1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	42	0	1	0	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	56	56	0	0.0	8	62
2	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	57	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	67	67.	0	0.0	8	63
..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	96	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	107	103	4	3.7	5	64
2	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	72	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	77	77	0	0.0	5	65
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	2	0	..	..	..	..	..	..	..	..	..	..	..	..	18	1	..	..	..	..	1	0	..	..	..	..	..	..	..	..	47	45	2	4.3	10	66
..	..	1	0	..	..	..	..	..	..	1	0	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4	0	..	..	..	..	..	..	..	..	..	..	..	..	18	15	3	16.7	9	67
2	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	3	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	64	0	..	..	1	0	..	..	..	..	..	..	84	81	3	3.6	11	68
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	87	1	..	..	12	0	..	..	..	..	1	0	113	111	2	1.8	8	69
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	19	0	..	..	..	..	..	..	1	0	35	34	1	2.9	5	70
..	..	1	0	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	3	0	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	1	0	..	..	53	0	..	..	1	0	77	76	1	1.3	14	71
..	..	1	0	1	0	..	..	..	..	..	..	2	0	..	..	3	4	..	..	1	0	4	1	..	..	1	0	..	..	..	..	..	..	1	0	..	..	1	0	..	..	..	..	..	..	1	0	1	0	40	0	..	..	1	1	86	78	8	9.3	19	72
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	6	6	0	0.0	5	73
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	4	3	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	21	17	4	19.0	9	74
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	8	1	11.1	7	75
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	0	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	10	9	1	10.0	7	76
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	0	0	0.0	0	77
1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	11	11	0	0.0	6	78
..	..	3	0	..	..	..	..	..	..	..	..	..	..	..	..	4	3	1	0	0	1	2	0	..	..	..	..	1	0	..	..	..	..	..	..	..	..	1	0	..	..	..	..	1	0	..	..	..	..	1	0	..	..	..	..	39	34	5	12.8	19	79
..	..	..	..	..	..	..	..	..	..	1	0	..	..	1	0	1	0	2	0	1	0	1	0	..	..	..	..	3	0	..	..	..	..	..	..	..	..	1	0	..	..	..	..	1	0	1	0	..	..	..	..	..	..	..	..	37	36	1	2.7	19	80
..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	2	0	2	100.0	2	81
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	6	3	33.3	6	82
1	0	8	0	..	..	1	0	..	..	0	1	7	7	..	..	192	256	1	0	8	4	46	34	1	0	..	..	3	0	7	0	..	..	3	3	..	..	4	2	..	..	..	..	10	0	1	0	4	0	2	0	..	..	5	1	1,006	524	482	47.9	35	83
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	14	13	1	7.2	5	84
1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4	8	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	89	23	66	74.2	8	85
..	..	..	..	..	..	..	..	..	..	..	..	2	1	..	..	45	23	..	..	..	..	16	10	..	..	..	..	..	..	..	..	..	..	..	..	..	..	37	2	..	..	..	..	..	..	..	..	..	..	11	0	..	..	..	..	202	155	47	23.3	9	86
77		230		3		102		0		9		65		2		676		126		34		417		66		42		278		12		63		26		155		313		25		4		170		54		26		132		4		51		6,473	....	...	....	..	87
77		230		3		96		0		6		54		2		339		125		26		371		66		42		277		12		63		23		155		305		24		4		168		54		26		132		4		48		....	5,716	...	....	..	88
0		0		0		6		0		3		11		0		337		1		8		46		0		0		1		0		0		3		0		8		1		0		2		0		0		0		0		3		....	....	757	....	..	89
0.0		0.0		0.0		5.9		0.0		33.3		16.9		0.0		49.8		0.8		23.5		11.0		0.0		0.0		0.4		0.0		0.0		11.5		0.0		2.6		4.0		0.0		1.2		0.0		0.0		0.0		0.0		5.9		....	....	...	11.7	..	90
23		24		25		26		27		28		29		30		31		32		33		34		35		36		37		38		39		40		41		42		43		44		45		46		47		48		49		50							

practice medicine in 1951 and who thus represent additions to the medical profession in the United States and its territories and outlying possessions.

The greatest number of licenses issued in 1951, both by examination and by endorsement of credentials, was granted by California. This state issued 1,367 licenses. New York issued 1,107, and more than 500 physicians were registered in Illinois, Ohio, Pennsylvania, and Texas. The fewest number were licensed in Nevada (13), while the states of Idaho, Maine, Montana, New Hampshire, North Dakota, Rhode Island, South Dakota, Vermont, and Wyoming issued less than 50 licenses.

There was a decrease of 201 in the total number of licenses issued in 1951 as compared with the previous year. This decrease was the result of fewer licenses issued by endorsement of credentials. There was an increase of 259 in the number of physicians registered after written examination.

Totals of the physicians licensed for 16 previous years and for 1951, both by examination and reciprocity, are included in table 3. The variations shown for the years from 1936 to 1941 inclusive were due to the increase in the licensure of foreign-trained physicians. The increases in recent years resulted from the increase in the production of physicians in the United States, the mobility of physicians and also from the licensure of foreign-trained physicians.

Table 3.—*Licenses Issued, 1935-1951*

	Examination	Reciprocity and Endorsement	Total
1935	5,725	2,194	7,919
1936	6,276	2,773	9,049
1937	6,629	3,205	9,834
1938	6,557	2,956	9,513
1939	6,400	2,872	9,272
1940	6,289	2,866	9,155
1941	6,057	2,762	8,819
1942	6,152	2,469	8,621
1943	6,062	2,340	8,402
1944	7,080	2,596	9,676
1945	5,580	3,622	9,202
1946	6,567	9,669	16,236
1947	6,763	7,701	14,464
1948	5,997	7,595	13,592
1949	5,252	6,929	12,181
1950	5,454	6,755	12,209
1951	5,713	6,295	12,008
Totals	104,553	75,599	180,152

In 17 years, 1935 to 1951, the number of medical licenses issued in the United States totaled 180,152, 104,553 after written examination and 75,599 by endorsement of credentials.

Candidates Examined by Medical Examining Boards

Compilations referring to those examined in 1951 by individual states, the District of Columbia, Alaska, Hawaii, Puerto Rico, and the Virgin Islands, indicating the number who passed and failed in each state, the medical school of graduation, the percentage of failures for each school, as well as each licensing board and the number of states in which graduates of a given school were examined are recorded in table 2. Medical schools in the United States which are no longer in operation, unapproved medical schools in the United States, foreign faculties of medicine, and schools of osteopathy are not listed by name, but the numbers examined in each state in these four categories are included following those for existing medical schools in the United States and Canada.

Table 4.—*Source of Candidates Examined for Licensure in the United States, 1951*

Medical Schools	Number of Schools	Number Examined	Number Passed	Number Failed	Percentage Failed
Approved in United States	72	5,018	4,874	144	2.9
Approved in Canada	9	144	127	17	11.8
Extinct	5	14	13	1	7.2
Foreign	146	1,006	524	482	47.9
Unapproved Schools	5	89	23	66	74.2
Schools of Osteopathy	7	202	155	47	23.3
	244	6,473	5,716	757	11.7

During 1951 there were 6,473 applicants for licensure by written examination, of whom 5,716 passed and 757, or 11.7%, failed. The candidates examined represented 72 approved medical schools in the United States, 9 approved medical schools of Canada, 5 United States medical schools now extinct, 142 faculties of medicine, and 4 licensing corporations of foreign countries, 5 unapproved medical schools in the United States and 7 schools of osteopathy. Osteopaths who were granted the privilege to practice medicine, surgery, or both, by medical examining boards are included in these statistics. Osteopaths who obtain the legal right to special practice by other than medical examining boards are not included in these compilations. One medical school in Canada had none of its graduates examined in the United States in 1951.

Examination and reciprocity meetings are scheduled at frequent intervals by licensing boards in most of the states to facilitate licensure and enable physicians to commence the practice of medicine without undue delay. Later in this study there is included a tabulation giving the schedules for all states. The publication of the dates of examinations and reciprocity or endorsement meetings is a regular biweekly feature of The Journal.

The 6,473 examinees (table 4) included 5,018 graduates of approved medical schools in the United States, of whom 2.9% failed; 144 graduates of approved medical schools in Canada, 11.8% of whom failed; 14 graduates of medical schools in the United States which are now extinct with 7.2% failures; 1,006 graduates of faculties of medicine located in countries other than the United States and Canada, 47.9% of whom failed; 89 graduates of unapproved medical schools in the United States, none of which are now in existence, with 74.2% failures, and 202 graduates of schools of osteopathy with 23.3% failures.

Table 5.—*Graduates of Medical Schools in Canada Examined for Licensure in the United States, 1951*

	Examined	Passed	Failed
[illegible]	1	1	0
California	20	20	0
Connecticut	4	4	0
District of Columbia	1	1	0
Florida	8	3	5
Georgia	1	1	0
Idaho	1	1	0
Illinois	9	8	1
Indiana	6	6	0
Iowa	2	2	0
Louisiana	2	2	0
Maine	8	6	2
Maryland	3	3	0
Massachusetts	4	4	0
Michigan	8	8	0
[illegible]	13	13	0
[illegible]	1	1	0
[illegible]	3	3	0
[illegible]	2	1	1
New Mexico	1	1	0
New York	10	7	3
North Carolina	3	3	0
North Dakota	8	4	4
Ohio	7	7	0
[illegible]	1	1	0
[illegible]	6	6	0
Rhode Island	1	1	0
South Carolina	1	1	0
Texas	2	2	0
Virginia	3	2	1
Washington	3	3	0
Wisconsin	1	1	0
Totals	144	127	17

As in table 1, the 6,473 physicians and others examined for medical licensure do not represent an equal number of persons, since a candidate tested in more than one state in a calendar year is counted in each state. However, if a candidate failed more than once in a given state within the year, he is counted in that state as a single failure. Figures which show the number of individual licentiates added to the medical profession in 1951 are given in tables 12, 13, and 14.

The greatest number of graduates from any one school examined was 175, representing the University of Illinois

College of Medicine, 114 of whom were tested in Illinois and 61 in 19 other states. The greatest number examined from private medical schools was 155, representing Northwestern University Medical School. Graduates of this school were tested in 22 states, 76 being examined in Illinois, where the school is located. Fourteen other schools had more than 100 of their graduates examined for medical licensure throughout the United States in 1951 as follows:

	No. of Examinees	No. of States in Which Examinations Were Taken
University of Tennessee	151	11
Tulane University	147	6
Jefferson Medical College	145	21
University of Michigan	127	7
St. Louis University	126	10
Indiana University	125	9
Washington University	116	9
Medical College of Virginia	113	8
University of Minnesota	108	12
University of Pennsylvania	112	21
University of Texas	107	5
University of Louisville	104	8
Louisiana State University	101	6
University of Cincinnati	101	8

Yale University with eight examinees, Buffalo with seven, Boston University with six, and Albany Medical College with five examinees represented schools with the fewest number of applicants for medical licensure by written examination before state boards. The majority of graduates of these four schools are licensed by endorsement of the certificate of the National Board of Medical Examiners.

The University of Washington School of Medicine appears for the first time in state board tabulations in 1951, although the school graduated its first class in 1950. Last year there were 35 graduates examined in 5 states, of whom 34 passed and 1 failed.

Nineteen approved schools in the United States had no failures before medical licensing boards, 35 less than 5% and 10 between 5 and 10%. There were eight schools with 10% or more of failures in state examinations. The over-all figures and percentages for failures are modified by including data on those who were examined by the National Board of Medical Examiners in its final examination as well as those who took the examinations of state boards (table 6).

There were 144 graduates of nine approved medical schools in Canada tested for medical licensure in 1951 in 31 states and the District of Columbia. The figures are given for each licensing board by school in table 2 and by totals in table 5. Of the 144 candidates, 127 passed and 17, or 11.8%, failed.

Graduates of foreign faculties of medicine were examined by 35 boards. There were 1,006 examined, of whom 524 passed and 482, or 47.9%, failed. Graduates of five unapproved medical schools were examined by eight boards. There were 89 examined of whom 23 passed and 66, or 74.2%, failed. Graduates of schools of osteopathy were tested in nine states. Represented were 202 graduates, of whom 155 passed and 47, or 23.3 per cent failed. Fourteen graduates of five approved medical schools in the United States no longer in operation were tested in 5 states, of whom 13 passed and 1 failed.

TABLE 6.—*Consolidated Results of Examinations, State Medical Examining Boards and the National Board of Medical Examiners, 1951*

School	Results of Medical Examining Board Tests		Part III Examination of National Board of Medical Examiners		Total Examined	Totals		Percentage Failed
	P	F	P	F		P	F	
Medical College of Alabama	62	4	6	0	72	68	4	5.6
University of Arkansas	89	4	0	0	93	89	4	4.3
College of Medical Evangelists	88	3	35	0	126	123	3	2.4
Univ. of Southern California	58	2	3	0	63	61	2	3.2
University of California	78	1	0	0	79	78	1	1.3
Stanford University	60	2	6	0	68	66	2	2.9
University of Colorado	59	1	3	0	63	62	1	1.6
Yale University	8	0	43	0	51	51	0	0.0
Georgetown University	12	0	77	0	89	89	0	0.0
George Washington University	15	1	74	2	92	89	3	3.3
Howard University	55	6	10	0	71	65	6	8.5
Emory University	88	1	8	0	97	96	1	1.0
Medical College of Georgia	89	3	0	0	92	89	3	0.0
Chicago Medical School	43	5	4	0	52	47	5	9.6
Northwestern University	152	3	23	0	178	175	3	1.7
Stritch School of Medicine	78	4	8	0	90	86	4	4.4
University of Chicago	43	1	29	1	74	72	2	2.7
University of Illinois	170	5	31	0	206	201	5	2.4
Indiana University	120	5	3	0	128	123	5	3.9
State University of Iowa	80	1	11	0	92	91	1	1.1
University of Kansas	93	1	1	0	95	94	1	1.1
University of Louisville	102	2	6	0	110	108	2	1.8
Louisiana State University	101	0	0	0	101	101	0	0.0
Tulane University	146	1	10	0	157	156	1	0.6
Johns Hopkins University	74	0	15	1	90	89	1	1.1
University of Maryland	91	1	4	0	96	95	1	1.0
Boston University	6	0	52	0	58	58	0	0.0
Harvard Medical School	39	0	103	1	143	142	1	0.1
Tufts	16	2	92	3	113	108	5	4.4
Universi	125	2	12	0	139	137	2	1.4
Wayne	65	1	0	0	66	65	1	1.5
University of Minnesota	108	0	4	0	112	112	0	0.0
St. Louis University	125	1	11	0	137	136	1	0.7
Washington University	114	2	12	0	128	126	2	1.6
Creighton University	64	5	11	0	80	75	5	6.2
University of Nebraska	82	5	6	0	93	88	5	5.4
Albany Medical College	4	1	51	1	57	55	2	3.5
State University of New York, New York City	23	7	96	1	127	119	8	6.3
University of Buffalo	6	1	66	0	73	72	1	1.4
Columbia University	25	1	90	2	118	115	3	2.5
Cornell University	28	3	39	0	70	67	3	4.3
New York Medical College	18	0	93	7	118	111	7	5.9
New York University	26	3	103	4	136	129	7	5.1
University of Rochester	23	2	44	0	69	67	2	2.9
State University of New York, Syracuse	12	2	39	1	54	51	3	5.6
Duke University	27	0	55	0	82	82	0	0.0
Bowman Gray School of Med.	63	1	1	0	65	64	1	1.5
University of Cincinnati	99	2	1	0	102	100	2	2.0
Western Reserve University	80	0	5	0	85	85	0	0.0
Ohio State University	82	0	11	0	93	93	0	0.0
University of Oklahoma	72	0	0	0	72	72	0	0.0
University of Oregon	57	0	5	0	62	62	0	0.0
Hahnemann Medical College	27	2	74	3	106	101	5	4.7
Jefferson Medical College	138	7	22	0	167	160	7	4.2
Temple University	73	0	47	0	120	120	0	0.0
University of Pennsylvania	112	0	25	0	137	137	0	0.0
Woman's Medical College	15	0	26	0	41	41	0	0.0
University of Pittsburgh	66	2	5	0	73	71	2	2.7
Med. College of South Carolina	65	2	1	0	68	66	2	2.9
University of Tennessee	147	4	0	0	151	147	4	2.6
Meharry Medical College	45	5	2	0	52	47	5	9.6
Vanderbilt University	56	0	2	0	58	58	0	0.0
Southwestern Medical School	67	0	0	0	67	67	0	0.0
University of Texas	103	4	0	0	107	103	4	3.7
Baylor University	77	0	3	0	80	80	0	0.0
University of Utah	45	2	2	0	49	47	2	4.1
University of Vermont	15	3	16	0	34	31	3	8.8
University of Virginia	81	3	7	1	92	88	4	4.3
Medical College of Virginia	111	2	2	0	115	113	2	1.7
University of Washington	34	1	0	0	35	34	1	2.9
University of Wisconsin	76	1	2	0	79	78	1	1.3
Marquette University	78	8	7	0	93	85	8	8.6
Subtotals: U. S. Schools	4,874	144	1,655	28	6,701	6,529	172	2.2
University of Alberta	6	0	0	0	6	6	0	0.0
University of Manitoba	17	4	0	0	21	17	4	19.0
Dalhousie University	8	1	4	0	13	12	1	7.7
Queen's University	9	1	2	0	12	11	1	8.3
University of Western Ontario	11	0	4	0	15	15	0	0.0
University of Toronto	34	5	8	0	47	42	5	10.6
McGill University	36	1	21	1	59	57	2	3.4
University of Montreal	0	2	3	0	5	3	2	40.0
Laval University	6	3	0	0	9	6	3	33.3
Subtotals: Canadian Schools	127	17	42	1	187	169	18	9.6
Extinct Medical Schools	13	1	0	0	14	13	1	7.2
Unapproved Medical Schools	23	66	0	0	89	23	66	74.2
Schools of Osteopathy	155	47	0	0	202	155	47	23.3
Foreign Medical Faculties	524	482	11	1	1,018	535	483	47.4
Totals	5,716	757	1,708	30	8,211	7,424	787	9.5

Elsewhere (tables 12, 13, and 14, pages 462 and 463) are given figures referring to actual licentiates and additions to the medical profession.

Consolidated Results of Examinations

A combination of the results by individual schools for two groups—those appearing before the state medical board examinations and those who took part 3 of the examinations of the National Board of Medical Examiners is given in table 6. This table represents a more accurate analysis of the performance of physicians from the individual schools in licensing examinations than those given in tables thus far presented. In some instances, it will be noted, schools having a high percentage of failures before state licensing boards had few, if any, failures before the National Board. In 1951 there were 5,018 graduates of approved medical schools in the United States examined by state boards, of whom 144, 2.6%, failed. In the same calendar year, 1,683 graduates of these institutions appeared for part 3 of the examinations of the National Board of Medical Examiners, of whom 28, or 1.6%, failed. For both groups the total examined was 6,701 and the percentage of failures was 2.2.

TABLE 7.—*Licensure Failures by Graduates of Existing Approved Medical Schools in the United States Located in the State Where Examined and Elsewhere, 1951*

States with Four Year Medical Schools	Total No. Examined	No. Failures of Schools in State	No. Schools in State Represented at Examinations	Per Cent Failed	No. Failures of Schools Out of State	No. Schools Out of State Represented at Examinations	Per Cent Failed	Per Cent Failed in All U. S. Schools
Alabama	62	2	1	3.2	0	6	0.0	3.2
Arkansas	87	4	1	4.6	0	2	0.0	4.6
California	554	5	4	0.9	9	47	1.6	2.5
Colorado	85	0	1	0.0	1	9	1.2	1.2
Connecticut	50	0	1	0.0	2	10	4.0	4.0
Dist. of Columbia	29	0	2	0.0	0	9	0.0	0.0
Georgia	147	0	2	0.0	0	6	0.0	0.0
Illinois	510	2	5	0.3	7	30	1.3	1.7
Indiana	119	2	1	1.7	0	6	0.0	1.7
Iowa	81	1	0	0.0	0	4	0.0	0.0
Kansas	92	0	1	0.0	0	8	0.0	0.0
Kentucky	104	0	1	0.0	0	7	0.0	0.0
Louisiana	217	0	2	0.0	0	19	0.0	0.0
Maryland	188	0	2	0.0	0	15	0.0	0.0
Massachusetts	114	0	2	0.0	4	14	3.5	3.5
Michigan	222	0	2	0.0	0	24	0.0	0.0
Minnesota	166	0	1	0.0	0	18	0.0	0.0
Missouri	230	0	2	0.0	0	15	0.0	0.0
Nebraska	102	1	6	1.0	0	1	0.0	1.0
New York	676	15	8	2.2	32	32	4.7	6.9
North Carolina	126	1	2	0.8	0	20	0.0	0.8
Ohio	417	1	3	0.2	1	21	0.2	0.4
Oklahoma	66	0	1	0.0	0	0	0.0	0.0
Oregon	42	0	1	0.0	1	11	2.4	2.4
Pennsylvania	278	0	6	0.0	1	14	0.3	0.3
South Carolina	63	0	1	0.0	0	4	0.0	0.0
Tennessee	155	0	3	0.0	0	2	0.0	0.0
Texas	313	3	3	0.9	1	30	0.3	1.2
Utah	25	1	1	4.0	0	5	0.0	4.0
Vermont	4	0	1	0.0	0	0	0.0	0.0
Virginia	170	1	2	0.6	0	4	0.0	0.6
Washington	54	0	1	0.0	0	12	0.0	0.0
Wisconsin	132	0	2	0.0	0	15	0.0	0.0
Subtotals	5,680	39	72	0.6	59	420	1.0	1.7
States Without Four Year Medical Schools								
Arizona	14				0	10	0.0	
Delaware	14				1	9	7.2	
Florida	427				39	62	9.0	
Idaho	8				0	4	0.0	
Maine	21				0	7	0.0	
Mississippi	77				0	21	0.0	
Montana	3				0	3	0.0	
Nevada	0				0	0	0.0	
New Hampshire	9				1	6	11.1	
New Jersey	65				3	17	4.6	
New Mexico	2				0	1	0.0	
North Dakota	34				0	8	0.0	
Rhode Island	12				0	3	0.0	
South Dakota	26				0	12	0.0	
West Virginia	26				0	9	0.0	
Wyoming	4				0	4	0.0	
Alaska, Hawaii and Puerto Rico	51				2	29	3.9	
Subtotals	793				46	205	5.7	

There were 189 graduates of approved medical schools in Canada examined by both state boards and the National Board in 1951, 11.7% failed state board tests and 2.3% failed the National Board examinations. For both groups 9.6% failed.

The National Board did not examine in 1951 a graduate of an approved medical school no longer in operation. The National Board does not admit to its examinations the graduates of unapproved medical schools in the United States or schools of osteopathy. Only 12 graduates of foreign medical faculties were admitted to the National Board's final examination, while 1,006 were examined by state licensing boards.

The total of all examined before medical licensing boards, as shown in table 6, was 6,473, of whom 5,716 passed and 757, or 11.7%, failed. For both groups—state boards and the National Board—8,211 were examined, 7,424 passed, and 787, or 9.5%, failed.

Failures in Medical Licensure Examinations

Failures before medical licensing boards by graduates of existing approved medical schools in the United States are recorded in table 7. In this compilation the United States is divided into two groups—the 32 states and the District of Columbia, in which approved four year medical schools are located, and those states and the territories and outlying possessions which had no four year medical school within their boundaries in complete operation in 1951. The figures include the total number examined, the number who failed state board examinations and were graduates of a medical school located in the state in which they were examined, and the number of failures in a given state who obtained their professional training in schools in other states.

In general, state licensing boards require the applicant to receive a general average of 75% and at least 60% in any one subject. In case of failure in not more than two subjects, the applicant is permitted a second examination in those subjects within 12 months. A few states consider such persons as conditioned in the subjects in which they fail. Conditioned candidates are not counted as failures in this study. When their grades are raised after a successful examination they are recorded among those who passed.

The physicians who failed examinations in the state in which they obtained their professional training numbered 39. This occurred in 13 states. There were 59 failures reported by 10 states among physicians who graduated from approved medical schools located in states other than the one in which they were examined. Fifteen states had no failures in either group, while five states had failures in both groups.

In the 16 states and the territories and outlying possessions which do not have four year medical schools in operation, five boards reported 46 failures.

The data pertaining to licensure failures are further subdivided in table 8 by the number of candidates who were licensed after previously failing a licensing examination. The figures are presented for four categories—

approved medical schools in the United States and Canada, foreign faculties of medicine, unapproved medical schools, and schools of osteopathy. These groups are classified according to the number licensed after failing a state board examination once and after two or more failures. The table further indicates whether the single and multiple failures have been in the state where licensed or elsewhere. The total number of candidates licensed after examination or by endorsement of credentials is shown and also the total number of failures in all groups.

Of the 12,008 licenses to practice medicine issued in 1951, 503 were granted to applicants who had previously been unsuccessful before a licensing board. All physicians licensed in 1951 in eight states had no failures in a state board examination.

From the approved schools, 188 graduates had previously failed a state board examination. Sixty-eight had one failure in the state in which they were licensed, while 78 were licensed after one failure elsewhere. Forty-two received licenses after more than one failure.

In the group of foreign medical faculties, 265 graduates were licensed after previous failure. One hundred and forty had more than one previous failure. Also, 21 graduates of unapproved medical schools and 29 graduates of schools of osteopathy were registered after previous failure.

TABLE 8.—*Failures Before Medical Licensing Boards by Licentiates, 1951*

	Licenses Issued by Examination, Reciprocity or Endorsement	Approved Schools					Foreign Schools					Unapproved Schools					Schools of Osteopathy					Total Failures by Licentiates, 1951
		Licensed After One Failure		Licensed After Two or More Failures			Licensed After One Failure		Licensed After Two or More Failures			Licensed After One Failure		Licensed After Two or More Failures			Licensed After One Failure		Licensed After Two or More Failures			
		Failed in State Where Licensed	Elsewhere	Failed in State Where Licensed	Elsewhere	Failed in State Where Licensed and Elsewhere	Failed in State Where Licensed	Elsewhere	Failed in State Where Licensed	Elsewhere	Failed in State Where Licensed and Elsewhere	Failed in State Where Licensed	Elsewhere	Failed in State Where Licensed	Elsewhere	Failed in State Where Licensed and Elsewhere	Failed in State Where Licensed	Elsewhere	Failed in State Where Licensed	Elsewhere	Failed in State Where Licensed and Elsewhere	
Alabama	128	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2
Arizona	74	..	1	..	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	3
Arkansas	129	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4
California	1,367	11	15	1	6	..	6	3	1	..	..	..	..	..	..	..	..	..	..	..	..	43
Colorado	168	..	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2
Connecticut	228	2	2	..	1	..	1	1	1	1	..	..	..	..	..	..	..	..	1	..	..	10
Delaware	28	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	1
District of Columbia	166	1	1	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	4
Florida	329	15	2	..	..	..	..	..	1	1	1	1	1	..	..	5	..	..	..	..	..	27
Georgia	226	..	..	..	2	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	3
Idaho	43	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0
Illinois	665	3	1	..	..	..	18	2	11	..	2	..	..	..	..	1	..	..	..	..	..	38
Indiana	238	..	..	..	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	4
Iowa	162	1	2	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	4
Kansas	185	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0
Kentucky	183	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0
Louisiana	303	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2
Maine	45	..	1	..	..	..	..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	3
[illegible]	298	..	..	..	..	..	2	..	..	3	1	..	..	..	..	..	..	..	..	..	..	6
[illegible]	299	2	..	1	..	..	1	1	..	..	1	..	..	2	..	..	..	1	2	..	..	11
[illegible]	417	..	2	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3
[illegible]	300	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
Mississippi	130	..	1	..	..	..	..	..	..	1	..	..	..	..	1	..	..	..	..	..	..	3
Missouri	356	..	1	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	3
[illegible]	41	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0
[illegible]	129	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	1
Nevada	13	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	1
New Hampshire	47	..	1	..	2	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	4
New Jersey	329	..	5	..	2	1	..	5	..	3	..	..	..	..	..	..	..	4	..	1	..	21
New Mexico	54	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2
New York	1,107	20	6	10	..	..	55	1	77	1	6	1	..	2	..	1	7	..	3	..	..	190
North Carolina	238	..	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3
North Dakota	42	..	1	..	..	..	1	1	..	1	..	..	..	..	..	..	..	..	..	..	..	4
Ohio	664	1	6	..	2	..	12	5	4	7	2	..	..	..	..	..	5	..	..	..	..	44
Oklahoma	128	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0
Oregon	117	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
[illegible]	549	..	5	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	6
[illegible]	40	..	..	..	1	..	1	1	..	1	..	..	..	..	..	..	..	..	..	..	..	4
[illegible]	118	..	2	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3
South Dakota	46	..	..	..	..	1	1	1	..	..	..	..	..	..	..	..	..	1	..	..	..	4
Tennessee	253	..	1	..	2	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	4
Texas	632	3	3	1	..	..	..	..	..	..	..	..	3	1	..	..	2	..	..	..	..	13
Utah	64	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
Vermont	15	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0
Virginia	291	1	1	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4
[illegible]	188	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0
[illegible]	99	..	1	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	2
[illegible]	216	..	3	..	1	..	..	..	..	1	..	..	..	..	..	..	..	1	..	..	..	6
[illegible]	27	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0
Virgin Islands, Guam and Canal Zone	91	3	2	1	..	..	..	..	..	1	..	..	1	..	..	..	..	..	..	..	..	8
Totals	12,008	68	78	15	25	2	100	25	96	31	13	2	6	5	1	7	14	7	6	2	0	503

Five physicians had more than 10 failures before securing licenses. One of these was a graduate of a foreign medical school who had 11 failures, and 4 were graduates of unapproved medical schools in the United States. Three had 11, 12, and 13 failures, respectively, while one physician was licensed after 34 failures in the state. This person has repeatedly been unsuccessful in examination tests since 1937. A few of the states have no restrictions on the number of examinations which may be taken prior to licensure, but most states have a set limit of three examinations.

Registration by Reciprocity and Endorsement

The reciprocity and endorsement policies in medical licensure in the United States, Alaska, Hawaii, Puerto Rico, Guam, and the Virgin Islands are summarized in table 9. Florida is the only state which requires all applicants for licensure to pass a written examination. Hawaii does not have reciprocal relations with any state but will endorse physicians certified by the National Board of Medical Examiners. Eighteen states, the District of Columbia, and Alaska require applicants for licensure without written examination to obtain a certificate from the board of examiners in the basic sciences. In the section of this report pertaining to basic science boards there is included a table outlining the reciprocity, endorsement, exemption, or waiver policies of these boards.

Twenty-eight states, Alaska, and Puerto Rico have reciprocal agreements with specific states. In 21 states reciprocity is extended at the discretion of the licensing board. Sixteen states which have reciprocal agreements also have similar discretionary powers to endorse appli-

TABLE 9.—RECIPROCITY AND ENDORSEMENT

		Reciprocates with, or Endorses Certificates Granted by																														
Marginal Number	The Examining Board of	Alabama	Arizona	Arkansas	California	Colorado	Connecticut	Delaware	Dist. of Columbia	Florida	Georgia	Idaho	Illinois	Indiana	Iowa	Kansas	Kentucky	Louisiana	Maine	Maryland	Massachusetts	Michigan	Minnesota	Mississippi	Missouri	Montana	Nebraska	Nevada	New Hampshire	New Jersey	New Mexico	Marginal Number
1	Alabama	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
2	Arizona	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2
3	Arkansas (regular board)	+	+	..	+	+	+	..	+	..	+	+	+	+	+	+	+	+	+	+	..	+	+	+	+	..	+	+	..	+	+	3
4	California	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4
5	Colorado	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5
6	Connecticut (reg. & homeo. bds.)	..	..	..	..	..	..	..	+	..	..	+	..	+	..	+	..	+	+	+	+	+	..	..	..	..	..	..	+	..	..	6
7	Delaware (regular board)	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	7
8	District of Columbia	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	8
9	Florida	No reciprocity or endorsement policies											..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9
10	Georgia	+	..	+	+	+	..	..	+	..	..	..	+	+	+	+	+	+	+	+	..	+	+	+	+	..	+	+	+	+	+	10
11	Idaho	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	11
12	Illinois	+	..	+	+	+	..	..	..	..	+	..	..	..	+	+	+	..	+	+	..	+	..	+	+	..	+	+	..	+	..	12
13	Indiana	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	13
14	Iowa	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	14
15	Kansas	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	15
16	Kentucky	+	..	+	+	+	..	+	+	..	+	..	+	+	+	+	..	+	+	+	..	+	+	+	+	+	+	+	+	+	+	16
17	Louisiana (reg. & homeo. bds.)	+	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	+	+	17
18	Maine	..	..	+	+	+	..	..	..	..	+	..	..	..	..	..	..	+	..	+	+	+	+	..	+	+	+	+	+	..	+	18
19	Maryland (reg. & homeo. bds.)	+	..	+	+	..	+	+	+	..	+	+	+	+	+	+	+	+	+	..	+	+	..	+	+	+	+	+	+	+	+	19
20	Massachusetts	+	..	..	..	..	+	+	+	..	+	+	..	+	+	+	+	+	+	+	..	..	..	+	+	+	..	..	+	+	..	20
21	Michigan	+	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	21
22	Minnesota	+	+[41]	+	+	+[41]	+[41]	+	..	..	+	+[41]	..	+[41]	+	+[41]	+	+	+	..	+[41]	+	..	+	+	+	+	+	+[41]	+	+	22
23	Mississippi	+	+	+	+	+	+	+	+	..	+	..	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	23
24	Missouri	+	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	+	+	+	+	+	+	24
25	Montana	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	25
26	Nebraska	+	+	+	+	+	+	+	+	..	+	..	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	26
27	Nevada	+	..	+	+	+	..	..	+	..	+	+	+	+	+	+	+	+	+	+	..	+	+	+	+	+	+	..	+	+	..	27
28	New Hampshire	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	28
29	New Jersey	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	29
30	New Mexico	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	30
31	New York	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	31
32	North Carolina	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	32
33	North Dakota	+	..	+	+	+	..	..	..	..	+	..	+	+	+	+	+	+	+	..	..	+	..	..	+	+	+	+	+	+	+	33
34	Ohio	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	34
35	Oklahoma	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	35
36	Oregon	+	+	+	+	+	+	+	..	..	+	+	+	+	+	..	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	36
37	Pennsylvania	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	37
38	Rhode Island	..	+	+	+	+	+	..	+	..	..	+	+	+	+	+	+	..	..	+	+	+	+	+	+	..	+	+	+	+	+	38
39	South Carolina	+	..	..	..	..	..	..	+	..	+	..	..	+	..	+	+	+	+	+	..	+	..	+	+	..	+	..	+	+	..	39
40	South Dakota	+	+	+	+	+	..	..	..	..	+	..	..	+	+	+	+	+	..	..	..	+	+	+	..	+	+	+	..	..	+	40
41	Tennessee	+	+	+	+	+	+	+	+	..	+	..	+	+	+	+	+	+	+	+	..	+	+	+	+	+	+	..	+	+	+	41
42	Texas	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	42
43	Utah	+	+	+	+	+	+	+	..	+	..	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	43
44	Vermont	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	44
45	Virginia	+	+	+	+	+	+	+	+	..	+	..	+	..	+	..	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	45
46	Washington	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	46
47	West Virginia	+	..	+	[38]	[38]	+	+	+	..	+	..	+	[38]	[38]	[38]	+	+	+	+	[38]	+	+	+	+	+	+	+	..	+	..	47
48	Wisconsin	+	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	48
49	Wyoming	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	49
50	Alaska	+	..	+	+	+	+	..	+	..	..	..	..	+	..	+	+	..	..	+	..	+	+	+	+	..	..	+	+	+	..	50
51	Guam	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	51
52	Hawaii	No reciprocal relations..							..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	52
53	Puerto Rico	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	..	..	+	..	+	..	..	..	..	53
54	Virgin Islands	No reciprocal relations..							..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	54

This summary should be supplemented by direct communication with the

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Some states have additional requirements for graduates of schools outside the United States and Canada.

+, indicates reciprocal or [illegible] been established; .. indicates no recipro[illegible] have been established. (See column—"At [illegible] dicates full

1. 1st P, first papers requ[illegible] citizenship required, in other [illegible] or registration fee.

2. In most cases there is [illegible]

3. Year of practice after internship required.

4. Internship accepted in lieu of one year's practice.

5. Professional practice required.

6. All applicants must be graduates of a medical school approved by the American Medical Association.

7. Just preceding application.

8. No basic science reciprocity—examination must be within the state.

9. Basic science certificate required either by reciprocity or examination in addition to basic science subjects of National Board.

10. Canadian citizens are required to file first papers.

11. Not applicable to citizens of Canada.

12. Oral examination required when application is based on a license issued by some other state dated ten or more years prior to filing application.

13. Applicant must have resided in the state used as basis of application for one year after date on said certificate, or show two years of licensed practice in some other state.

14. Oral examination required.

15. Certificate used as the basis for application must be dated one or more years prior to filing application.

16. Actual practice for a period of three years immediately preceding date of application.

17. Practical, clinical examination required.

18. In lieu of its own examination, certificate of National Board may be accepted in whole or in part.

19. Regular and Homeopathic boards.

20. Reciprocity is extended to all states which accept Oregon licentiates on reciprocity basis.

cants from nonreciprocating states who present credentials which correspond with those required by their respective states in the year issued.

There is also included in this table a column indicating the recognition accorded the certificate of the National Board of Medical Examiners. All states but Florida and Texas accept the National Board's certificate.

Additional requirements including professional practice, citizenship, oral examination and internship, and the fee for a license by reciprocity or endorsement are also recorded. In some states physicians of Canadian birth are exempt from the citizenship requirement. This is indicated by footnote. Few states will accept graduates of foreign faculties of medicine on a reciprocal basis. Other requirements or exemptions are indicated by footnotes.

This chart will be made available in reprint form. It is helpful to physicians who are considering a change in

POLICIES OF MEDICAL LICENSING BOARDS

	Reciprocates with, or Endorses Certificates Granted by																							Requirements						
Marginal Number	New York	North Carolina	North Dakota	Ohio	Oklahoma	Oregon	Pennsylvania	Rhode Island	South Carolina	South Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	West Virginia	Wisconsin	Wyoming	Alaska	Puerto Rico	At the Discretion of the Board	National Board of Medical Examiners	Basic Science Certificate	Internship	Professional Practice	Citizenship [1]	Fees, Dollars [2]	Miscellaneous	Marginal Number
1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	..	⊕	1[4]	⊕[11]	50	..	1
2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	⊕[9]	⊕	3[4,7]	1st P	100	42	2
3	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	+	+	+	+	..	..	+[9]	⊕	..	1[4]	⊕	50[22]	42	3
4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	..	⊕	1[13]	⊕[21]	100	12,15	4
5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+[43]	+[9]	⊕	⊕	1[4]	⊕	50	42	5
6	..	..	..	+	..	..	+	+	..	..	+	+	..	+	..	..	+	..	..	..	..	+	+[27]	⊕[19]	..	3[16]	1st P[10]	50	..	6
7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+[5]	..	⊕	2	⊕	100	..	7
8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+[27]	⊕	⊕	1[3]	..	50	..	8
9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9
10	..	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	..	..	..	..	+	..	..	0	⊕	50	..	10
11	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	..	⊕	..	⊕	100	..	11
12	..	+	+	+	+	+	+	+	..	..	+	+	+	+	+	+	+	+	+	+	..	..	+[17]	..	⊕	1	1st P	25	17,42	12
13	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	..	..	1[4]	..	50	..	13
14	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	⊕	⊕	1[4]	⊕[11]	50	..	14
15	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	..	⊕	1[4,7]	⊕	50	42	15
16	..	..	+	+	+	..	+	..	+	+	+	+	+	+	+	+	+	+	..	..	..	..	+	..	..	1[4]	⊕	50	42	16
17	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	..	..	+[25]	..	..[33]	1[4]	1st P[40,10]	50[22]	42	17
18	..	..	+	..	+	..	+	..	+	..	+	..	+	+	+	..	+	+	+	..	..	..	+	..	..	1[4]	..	50	..	18
19	+	+	..	+	+	+	+	+	+	..	+	+	..	+	+	..	+	+	..	+	+	+	+	..	..	1[4]	1st P	50	42	19
20	+[44]	+	..	+	+	..	+	+	+	..	+	+	+	+	+	..	+	+	..	..	..	+	+	..	..	0	1st P	50[28]	..	20
21	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+[35]	⊕[37]	⊕	1[4]	..	50	34	21
22	+[41]	+	..	+[41]	+	+	+	+[41]	..	+	+	+	..	+	+	+	+	+	+	+	..	+	+	⊕	..	0	1st P	75	17,42	22
23	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	+	..	+	+	..	..	..	⊕[11]	50	42,11	23
24	..	+	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	+	+[27]	..	⊕[33]	1[4]	⊕	100	..	24
25	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	..	..	1[4]	⊕	75	14,42	25
26	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	+	..	..	+[36]	⊕	..	1[4]	⊕	50	..	26
27	+	+	..	+	+	+	+	+	..	+	+	+	+	+	..	+	+	+	..	+	..	..	+	⊕	⊕	1[4]	⊕	200	14,42	27
28	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	..	⊕	0	⊕[11]	50	..	28
29	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	+	+	..	⊕	0	⊕	100	..	29
30	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	⊕	..	1[4]	1st P	50	..	30
31	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	..	..	2	1st P	30	..	31
32	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	..	..	0	..	50	42,6	32
33	..	+	..	+	+	+	+	..	..	+	..	+	+	+	+	+	+	+	+	+	..	..	+	..	⊕	1	⊕	50[22]	14,42	33
34	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	+	+	..	..	1[4]	⊕	50	..	34
35	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	⊕[32]	⊕	1[4]	⊕	100	42,11,6	35
36	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	+[20,23]	+[9,27]	⊕	⊕	1[4]	⊕	100	..	36
37	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	..	⊕	2[24]	1st P	50	42	37
38	..	+	..	+	+	..	+	..	..	..	+	..	..	+	..	+	+	+	+	..	..	+[14]	+[14]	⊕	⊕	0	1st P	20	14	38
39	..	+	..	+	+	+	+	..	..	..	+	+	..	..	+	..	+	+	+	..	+	..	+[14]	..	..	1[4]	⊕	50	42	39
40	..	+	+	+	+	+	..	..	+	..	+	..	+	+	+	+	+	+	+	..	..	..	+	⊕	⊕	1	1st P	50	..	40
41	+	+	..	+	+	..	+	..	+	+	..	+	+	..	+	+	+	+	+	..	..	..	+[30]	⊕	..	0	⊕	50	42	41
42	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	+	⊕	..	0	..	50	..	42
43	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	..	+	+	..	⊕	[31]	..	50	42	43
44	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	..	⊕	1[3]	⊕	50	11	44
45	+	+	..	+	+	+	+	..	+	+	+	+	+	+	..	+	+	+	..	+	+	+	+	..	..	2[26]	1st P	50	..	45
46	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+[8]	⊕[8]	⊕	0	..	25	..	46
47	..	+	+	+	+	+	+	[38]	+	+	+	+	+	+	+	..	..	+	+	+	..	..	+	..	⊕	0	⊕	100	..	47
48	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	+	..	+	+[14]	+[18]	⊕	⊕	1[20]	1st P	75[22]	6	48
49	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+[14]	+[14]	..	⊕	0	⊕	50	..	49
50	..	+	+	+	+	+	..	..	..	..	+	+	+	+	+	+	+	+	..	..	..	..	+	⊕	⊕	0	⊕	100	6	50
51	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	..	⊕	0	⊕	50	6	51
52	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	..	⊕	..	⊕	25	42,6	52
53	..	..	+	..	..	..	..	..	+	..	..	..	..	..	..	..	..	+	..	..	..	+[3,30]	+	..	⊕	1[3]	⊕	30	..	53
54	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	54

secretary of the licensing board of the state in which the physician is interested.

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21. Not required if country in which applicant is licensed will admit to practice citizens of the United States licensed to practice in some state or on proof of requirements similar to those required by California for graduates of foreign medical schools.
22. Fee same as applicant's state charges.
23. Oral examination required if applicant's state requires it.
24. If the applicant passes the examination in the state from which he transfers after the completion of his internship, no practice is required.
25. License in state with which Louisiana reciprocates required.
26. Internship accepted at the discretion of the board as the equivalent of two years' practice.
27. Fee, $25.
28. Fee for license on basis of National Board certificate, $25.
29. A two year internship is accepted.
30. Diplomates of National Board not required to have been in practice for three years.
31. Same as required of candidates of state applying for licensure.
32. Not required for licensure by reciprocity.
33. Reciprocity applicants only.
34. Supplemental examination required in certain cases when accepting the examination of a state with whom reciprocal relations have not been established.
35. May be licensed after a special (written) supplemental examination.
36. Fee, $50.
37. [illegible])ct. 15, 1937.
38. [illegible] Colorado, Indiana, Iowa, Kansas, Massachusett [illegible] epted on reciprocal basis at discretion of board.
39. Reciprocity extended at discretion of board to states having similar licensing requirements and which accept Puerto Rico licentiates on equal terms.
40. Permanent license withheld until completion of citizenship.
41. At the discretion of the board.
42. Graduates of foreign medical schools are not accepted.
43. Reciprocity extended at discretion of board to states having comparable licensing requirements and which accept Colorado applicants on a substantially equal reciprocal basis.
44. If registered after July 1, 1945.

TABLE 10.—*Candidates Licensed by Reciprocity and Endorsement of Credentials, 1951*

		Source of Former License or Credentials																																																					
Marginal Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55
States Issuing Licenses by Reciprocity or Endorsement	Total Licensed	Alabama	Arizona	Arkansas	California	Colorado	Connecticut	Delaware	Dist. of Columbia	Florida	Georgia	Idaho	Illinois	Indiana	Iowa	Kansas	Kentucky	Louisiana	Maine	Maryland	Massachusetts	Michigan	Minnesota	Mississippi	Missouri	Montana	Nebraska	Nevada	New Hampshire	New Jersey	New Mexico	New York	North Carolina	North Dakota	Ohio	Oklahoma	Oregon	Pennsylvania	Rhode Island	South Carolina	South Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	West Virginia	Wisconsin	Wyoming	U.S. Govt. Services	National Board of Medical Examiners	Alaska, Hawaii and Puerto Rico	Canadian, Foreign	Special Exemption
Alabama	59	..	..	..	..	..	..	..	1	..	9	..	3	..	..	..	..	5	..	..	..	1	1	3	2	1	..	..	..	..	..	1	..	..	2	1	..	..	..	1	..	12	..	..	..	2	..	2	..	..	..	12	..	..	..
Arizona	60	..	..	1	1	2	..	1	..	..	..	..	5	3	3	..	2	1	..	..	..	4	10	..	3	..	5	..	..	1	..	..	..	..	2	..	..	4	..	..	..	1	2	..	..	..	2	..	2	..	..	5	..	..	..
Arkansas	46	..	..	..	..	..	..	..	..	..	..	..	1	..	..	3	1	3	1	2	1	2	1	1	3	..	..	..	..	1	..	2	1	..	..	4	..	1	..	..	..	12	1	..	..	1	..	..	1	..	..	3	..	..	..
California	844	1	4	4	..	23	3	1	3	5	3	1	95	26	6	6	5	15	2	24	2	37	53	2	24	..	20	..	1	10	..	40	3	3	45	7	11	35	1	2	2	12	16	8	2	7	12	3	20	..	18	216	2	..	3
Colorado	84	..	1	2	5	..	..	..	..	..	..	..	3	1	2	5	1	..	..	..	2	1	12	..	6	..	3	..	1	..	..	3	..	1	5	3	..	2	1	..	..	1	1	..	..	..	..	..	..	..	..	22	..	..	..
Connecticut	195	..	..	..	1	..	..	..	1	..	1	..	3	..	..	..	1	1	2	5	2	4	1	1	1	..	..	..	..	2	..	35	1	..	2	..	..	8	..	..	..	1	1	..	2	3	..	2	..	..	..	114	..	..	..
Delaware	15	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	5	1	..	..	..	..	..	..	..	..	..	..	2	..	..	1	..	..	4	..	..	..	..	..	..	..	1	..	..	..	..	..	...	..	..	..
Dist. of Columbia	139	..	..	..	3	..	..	..	..	..	..	..	4	2	..	..	..	2	..	15	..	..	..	..	2	..	..	..	1	2	..	4	1	..	3	..	..	7	..	..	..	1	2	..	..	4	..	2	1	..	..	76	3	4	..
Florida	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	...	..	..	..
Georgia	80	1	..	..	4	..	..	..	..	..	..	..	3	1	..	..	3	5	..	7	..	2	2	..	1	..	1	..	..	..	..	..	6	..	1	2	..	1	..	4	..	7	1	..	..	6	..	..	..	..	..	21	1	..	..
Idaho	35	..	1	..	6	..	..	..	..	..	..	..	2	1	2	1	1	..	..	1	..	..	3	..	1	..	..	..	..	..	..	1	..	..	..	..	3	2	..	..	1	..	..	3	1	..	3	..	..	..	..	2	..	..	..
Illinois	203	..	..	..	4	1	..	..	1	..	2	..	..	12	6	5	2	4	..	6	..	10	..	..	16	..	4	..	..	1	..	1	1	1	10	2	..	8	..	..	..	4	4	2	..	1	2	1	9	..	..	83	..	..	..
Indiana	125	..	..	1	1	1	2	..	..	..	1	..	32	..	3	1	12	..	..	..	1	2	2	..	14	..	2	..	..	..	..	3	..	1	13	..	..	6	..	..	1	1	1	1	..	1	..	..	6	..	..	16	..	..	..
Iowa	85	1	..	2	3	3	..	..	1	..	1	..	8	1	..	2	2	1	1	1	..	3	7	..	3	..	13	..	..	..	..	3	..	..	3	..	..	5	..	..	..	..	..	..	..	1	1	..	1	..	..	17	1	..	..
Kansas	93	1	1	1	4	1	..	..	..	..	3	..	12	2	1	..	1	3	..	3	..	2	2	..	11	..	2	..	..	1	..	3	1	..	2	6	1	2	..	..	1	3	..	..	..	2	..	..	1	..	..	20	..	..	..
Kentucky	82	..	..	..	1	1	..	..	..	..	1	..	7	4	..	..	..	3	..	2	..	1	..	..	2	1	1	..	..	..	..	3	4	..	10	..	..	5	..	..	..	16	2	..	..	3	1	1	1	..	..	12	..	..	..
Louisiana	85	2	..	12	1	..	1	..	..	..	4	..	5	..	..	1	5	..	..	2	2	1	1	5	5	..	..	..	1	..	..	5	2	..	1	..	..	5	1	1	6	4	7	..	..	1	..	..	4	..	..	...	..	..	..
Maine	30	..	..	..	1	..	2	..	..	..	..	..	2	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	21	..	..	..
Maryland	122	1	..	..	5	1	2	..	10	..	6	..	4	3	1	1	1	..	2	..	..	1	..	1	1	..	1	..	..	..	..	4	2	..	3	..	..	8	..	1	..	1	1	..	..	7	..	..	2	..	..	51	1	..	..
Massachusetts	264	1	..	..	..	..	3	1	..	..	3	..	..	2	..	1	1	2	..	4	..	..	..	..	1	..	1	..	2	4	..	2	..	..	6	1	..	9	1	2	..	1	1	..	5	4	..	2	1	..	..	203	..	..	..
Michigan	214	..	..	3	9	1	1	..	..	..	1	..	25	9	2	6	5	2	..	8	4	..	5	2	9	1	6	..	..	3	..	4	2	2	16	3	1	11	..	..	..	8	4	1	..	2	3	..	9	..	..	46	..	..	..
Minnesota	134	1	..	..	5	2	..	..	..	..	2	1	..	6	5	..	5	2	1	..	..	7	..	..	7	..	5	..	..	1	..	3	1	..	5	1	..	3	..	..	..	1	10	..	..	7	2	..	2	..	..	48	1	..	..
Mississippi	53	3	..	3	1	..	..	..	..	..	1	..	1	1	..	..	2	12	..	2	..	1	1	..	3	..	..	..	..	..	..	..	3	..	..	..	..	1	..	..	..	9	1	..	..	..	1	..	..	..	..	5	..	2	..
Missouri	128	..	..	2	3	2	..	..	..	..	1	..	11	1	1	22	2	4	..	3	2	6	3	1	..	..	4	..	..	..	..	1	1	..	4	2	..	4	..	..	..	4	8	..	..	2	1	..	4	..	..	29	..	..	..
Montana	38	..	..	..	3	3	..	..	..	..	..	1	4	..	..	1	1	..	..	..	..	2	3	..	4	..	2	..	..	..	..	2	..	1	..	..	1	2	..	..	..	..	..	..	..	..	2	2	2	..	..	2	..	..	..
Nebraska	33	1	..	1	..	1	..	..	1	..	..	..	6	1	4	1	..	..	..	..	..	..	2	..	1	..	..	..	..	..	..	..	1	..	2	1	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	9	..	..	..
Nevada	13	..	..	..	2	1	..	..	..	..	..	..	..	..	1	..	1	..	..	..	..	1	2	..	..	..	..	..	..	..	..	..	..	..	1	1	..	1	..	..	..	..	..	1	..	..	..	..	..	..	..	1	..	..	..
New Hampshire	41	..	..	..	..	..	..	..	..	..	..	..	1	..	1	..	..	1	..	..	2	..	..	..	..	..	..	..	..	2	..	6	..	..	1	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	22	..	3	..
New Jersey	275	..	..	..	2	..	..	1	1	1	..	..	2	3	..	1	..	2	..	7	..	1	2	..	2	..	3	..	..	..	..	68	..	..	1	1	..	38	..	4	..	..	3	..	1	4	..	..	1	..	..	126	..	..	..
New Mexico	54	..	..	1	2	2	..	..	..	..	..	..	3	1	..	2	..	3	..	1	1	2	2	..	..	..	..	..	..	2	..	6	..	1	5	2	..	1	..	..	..	3	4	..	..	..	..	..	4	..	..	6	..	..	..
New York	771	1	..	1	9	3	1	..	3	1	3	1	5	4	1	..	3	7	..	22	1	3	8	..	1	..	5	..	..	8	..	..	8	1	2	..	1	35	1	..	..	4	5	1	3	8	..	1	7	..	..	580	3	19	1
North Carolina	113	2	..	2	4	..	..	..	..	..	9	..	1	..	..	..	2	3	1	1	..	4	3	..	1	..	..	..	..	..	1	5	..	..	2	..	..	11	..	6	1	5	1	..	..	18	..	2	..	..	..	28	..	..	..
North Dakota	16	..	..	..	1	..	..	1	..	..	..	..	2	1	1	..	..	..	..	..	..	..	..	..	..	1	1	..	1	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	1	..	..	4	..	..	1
Ohio	312	2	..	..	7	2	..	..	2	..	1	1	18	9	1	3	7	3	4	10	..	19	6	1	29	..	4	..	..	4	..	26	2	1	..	2	..	29	2	..	1	8	3	1	4	5	..	4	3	..	..	87	1	..	..
Oklahoma	53	..	..	8	2	..	1	..	..	..	1	..	2	2	1	2	..	1	..	1	..	..	3	..	1	..	1	..	..	1	..	2	..	1	5	..	..	3	..	..	..	5	5	..	..	..	..	..	1	..	..	4	..	..	..
Oregon	75	..	..	..	9	4	..	..	..	..	..	1	3	2	3	..	..	2	..	2	..	1	8	..	1	..	3	..	..	..	..	..	..	..	2	2	..	1	..	..	..	2	1	..	..	..	5	..	2	..	..	21	..	..	..
Pennsylvania	272	3	..	..	6	..	3	1	2	1	..	..	8	6	..	..	4	2	..	16	..	10	3	..	..	..	2	..	..	7	..	13	4	1	11	..	..	..	..	1	..	3	2	..	1	1	..	6	4	..	4	147	..	..	..
Rhode Island	28	..	..	..	..	..	1	..	1	..	..	..	1	..	..	..	..	..	..	..	2	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	1	2	1	..	..	..	..	..	..	1	..	..	..	..	17	..	..	..
South Carolina	55	3	..	..	..	..	..	..	1	..	9	..	..	1	..	..	..	2	..	..	..	1	..	..	..	..	1	..	..	1	..	..	10	..	2	..	..	1	..	..	..	6	..	..	..	6	..	2	1	..	..	7	1	..	..
South Dakota	25	..	..	..	1	1	..	..	..	..	..	..	..	..	..	2	1	..	..	..	..	1	9	..	..	..	4	..	..	..	..	..	..	1	1	..	..	..	..	..	1	..	..	..	..	..	1	..	..	..	..	2	..	..	..
Tennessee	79	1	..	2	5	..	..	..	..	..	7	..	1	1	1	..	4	3	..	..	..	1	3	8	2	..	2	..	..	..	..	6	1	..	2	1	..	4	..	..	..	..	2	..	..	3	..	1	3	..	..	14	1	..	..
Texas	325	3	..	9	6	6	1	..	2	..	8	..	66	13	4	12	13	30	..	5	3	6	11	6	21	..	2	..	..	1	..	12	1	..	13	9	1	17	..	3	..	19	..	..	1	10	1	1	5	..	1	3	..	..	..
Utah	37	..	..	..	4	2	..	..	..	..	..	1	4	1	..	..	..	..	..	3	..	2	..	..	1	..	1	..	..	..	..	1	1	..	2	..	2	3	..	..	..	3	..	..	..	..	..	..	..	..	..	6	..	..	..
Vermont	13	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	2	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	7	..	1	..
Virginia	123	..	..	2	1	..	..	1	6	..	5	..	2	..	1	..	3	2	..	14	..	5	..	..	..	..	1	..	..	1	..	6	6	..	4	..	..	3	..	5	..	2	1	..	1	..	1	5	2	..	1	42	..	..	..
Washington	136	1	..	..	18	1	..	..	..	..	..	..	4	1	3	1	2	4	..	3	..	3	10	..	14	1	10	..	..	..	..	5	..	..	3	1	8	3	..	..	1	2	1	1	..	1	..	..	2	..	..	31	..	1	..
West Virginia	73	..	..	1	1	1	..	1	..	..	1	..	1	2	..	1	5	..	..	5	..	2	3	..	..	..	..	..	..	..	..	..	..	..	3	..	..	9	..	1	..	3	1	..	..	13	..	..	1	..	..	18	..	..	..
Wisconsin	87	..	..	..	1	2	..	1	1	..	..	..	12	1	..	1	1	1	..	4	..	6	6	..	1	..	..	..	..	..	..	1	1	..	..	..	..	2	..	..	..	3	..	..	..	..	..	..	..	..	37	...	..	..	5
Wyoming	23	..	..	..	1	3	..	..	..	..	..	..	5	1	1	1	..	1	..	..	..	..	..	..	2	..	2	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	2	1	..	..	..	..	..	..	..	2	..	..	..
Alaska, Hawaii, Puerto Rico, Virgin Islands, Guam, Canal Zone	50	..	..	..	1	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	1	1	..	..	3	..	..	..	..	..	..	1	..	..	1	..	1	3	..	..	..	..	2	..	..	1	1	..	1	..	..	26	..	..	5
Totals	6,295	29	7	58	144	70	21	9	37	8	83	7	378	127	55	82	99	132	14	186	27	157	188	31	200	5	112	0	9	53	1	282	64	15	198	53	30	301	9	32	15	107	96	20	22	125	10	37	105	0	61	2,231	15	30	16
Marginal Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55

location. The facts recorded in this table are intended to present merely general statements of licensure policies. The information here given should be supplemented by direct communication with the licensing boards. A list of the executive officers in charge of medical licensure appears elsewhere in this study.

The procedure in issuing licenses by reciprocity or endorsement varies. Some states entertain applications for licensure at any time, while others hold monthly, quarterly or semi-annual meetings. The policy in effect in each state is contained in table 25 (page 469). In addition, THE JOURNAL publishes biweekly the exact dates when reciprocity or endorsement applications are considered.

The credentials presented by physicians granted licenses to practice medicine without written examination are given in table 10. There were 6,295 so registered on the basis of licenses from other states, the District of Columbia, the territories or outlying possessions of the United States, Canada, and foreign countries, the certificate of the National Board of Medical Examiners, by special exemption and by acceptance of service with an agency of the government of the United States.

California issued the greatest number of licenses by this method. In this state 844 were registered. New York licensed 771. Figures for other states were fewer than 325. Seven states licensed more than 200.

The largest number of candidates who presented the same type of credential were the 2,234 diplomates certified by the National Board of Medical Examiners. On the basis of the certificate of the National Board, 580 were licensed in New York, 216 in California, and 203 in Massachusetts. While the National Board reports Texas as one of the states which does not accept its certificate, three physicians were reported as licensed by endorsement of the National Board certificate in 1951. Delaware and Louisiana did not license any National Board diplomates by endorsement of the certificate last year.

There were 378 licenses issued in Illinois, 301 in Pennsylvania, and 282 in New York presented to other states for reciprocal registration. No physician holding a Nevada or a Wyoming license applied for registration by reciprocity in another state in 1951.

Five states registered 61 physicians by endorsement of credentials from one of the government services. Fifteen physicians were licensed in 10 states on the basis of a license issued in Alaska, Hawaii, or Puerto Rico; 30 in six states on the basis of Canadian or foreign credentials, and 15 by five boards were licensed by special exemption.

Table 11 records the number of individual schools represented by the 6,295 reciprocity licentiates. Every approved medical school in the United States and 9 of the 10 approved medical schools of Canada had graduates licensed without written examination in 1951. The 6,295 physicians registered without written examination in the United States in 1951 included 5,917 graduates of approved medical schools in the United States. No graduate of the University of Ottawa Faculty of Medicine in Canada applied for licensure in the United States in 1951. The University of Washington School of Medicine, which graduated its first class in June, 1950, had two of its graduates licensed by reciprocity in 1951. There were 214 graduates of Harvard Medical School licensed by reciprocity. More than 100 graduates of 25 schools secured such licenses. This table reflects the movement of physicians to states other than the one in which they obtained their professional training or in which they first established their practices.

One hundred and eight foreign-trained physicians obtained licenses by reciprocity or endorsement in 26 states and the territories and outlying possessions, and 65 graduates of medical schools no longer in operation were registered by 28 states. Fifty-two graduates of unapproved medical schools secured licenses in seven states and the territories and possessions, and 47 graduates of schools of osteopathy were registered in 8 states to practice medicine, surgery or both. There were 272 represented in these four groups. Thirty-four boards registered 106 graduates of Canadian medical schools.

Licentiates Representing Additions to the Medical Profession

Figures for the number of physicians who secured their first license to practice medicine and surgery in 1951 and who therefore represent additions to the medical profession in the United States and its territories and outlying possessions are presented in tables 12 and 13. Included in these compilations are figures pertaining to candidates examined and licensed in 1951, candidates who were examined in previous years but whose licenses were not issued until 1951 pending completion of a required internship, citizenship, or other technicalities, and physicians not previously licensed in any state who were certified during the year on the basis of the examinations of the National Board of Medical Examiners. The figures also include physicians licensed on the basis of governmental credentials and Canadian and foreign licenses. The majority represent recent graduates.

These official figures indicate that 6,325 persons were added to the physician population in 1951 in the United States, Alaska, Hawaii, Puerto Rico, Virgin Islands, Guam, and the Canal Zone. By reference to table 1 it can be noted that 12,008 licenses were issued during the year, indicating that 5,683 had previously been licensed. In 1951 there were about 3,700 deaths of physicians reported to the offices of the American Medical Association. When this figure is deducted from the number licensed in 1951 for the first time it will be seen that the net increase in the physician population in the United States and its territories and possessions was 2,625. The figure represents an increase of 417 in comparison with the net increase in 1950.

In analyzing table 12, it can be noted that New York had the greatest number of first licentiates, 743. California was second, with 526. Three states added more than 300 to their physician population, namely, Illinois 437, Ohio 394, and Pennsylvania 388. Increases as compared with 1950[1] occurred in 26 states.

The 6,325 licentiates representing additions to the medical profession in the last calendar year included 4,985 who secured their licenses by examination and 1,340 by endorsement of credentials. The latter were mainly physicians certified by the National Board of Medical Examiners.

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[1] J. A. M. A. 146:356 (May 26) 1951.

TABLE 11.—CANDIDATES LICENSED BY

Marginal Number

Marginal Number	SCHOOL	1 Alabama	2 Arizona	3 Arkansas	4 California	5 Colorado	6 Connecticut	7 Delaware	8 Dist. of Columbia	9 Florida	10 Georgia	11 Idaho	12 Illinois	13 Indiana	14 Iowa	15 Kansas	16 Kentucky	17 Louisiana	18 Maine
	ALABAMA																		
1	Medical College of Alabama, Birmingham	3	..	..	2	..	..	..	..	..	2	..	..	..	1	1	..	1	..
	ARKANSAS																		
2	University of Arkansas School of Medicine, Little Rock	..	1	..	6	2	..	..	..	..	..	..	..	1	2	1	1	11	..
	CALIFORNIA																		
3	University f Medicine, San Francisco	..	1	..	1	..	..	..	1	..	..	1	..	1	..	2	..	..	..
4	College of oma Linda-Los Angeles	..	2	..	6	7	..	..	3	..	4	3	1	..	1	..	..	..	..
5	University School of Medicine, Los Angeles	..	1	..	3	..	..	..	..	..	..	1	1	..	..	..	..	..	..
6	Stanford Medicine, Stanford University-San Francisco	..	..	..	4	2	1	..	1	..	..	1	1	..	..	..	..	..	..
	COLORADO																		
7	University of Colorado School of Medicine, Denver	..	2	..	19	2	..	..	..	..	..	1	..	1	..	1	1	..	..
	CONNECTICUT																		
8	Yale University School of Medicine, New Haven	..	..	1	5	1	23	..	2	..	1	1	2	..	1	2	1	1	..
	DISTRICT OF COLUMBIA																		
9	Georgetown University School of Medicine, Washington	..	..	..	12	1	5	1	20	..	1	..	2	1	..	..	..	..	1
10	George Washington University School of Medicine, Washington	1	..	..	11	2	1	..	25	..	1	..	3	..	2	2	..	..	1
11	Howard University College of Medicine, Washington	1	1	..	4	..	2	..	9	..	2	..	..	..	..	..	..	..	..
	GEORGIA																		
12	Medical College of Georgia, Augusta	4	..	..	1	..	1	..	..	..	..	..	1	..	..	2	1	2	..
13	Emory University School of Medicine, Atlanta	4	..	..	2	..	..	..	..	..	..	..	..	1	1	1	..	2	..
	ILLINOIS																		
14	Chicago Medical	..	..	..	2	..	..	..	..	..	..	..	2	2	1	..	1	..	..
15	Northwestern Un	4	1	2	29	6	1	..	1	..	2	4	18	10	3	7	1	1	2
16	Stritch School of	..	1	..	17	1	..	..	..	..	..	..	6	6	1	..	..	1	..
17	University of Ch	1	3	..	12	..	..	..	3	..	..	..	6	5	1	..	..	..	..
18	University of Ill	..	1	..	58	1	2	..	2	..	1	..	11	15	5	6	2	3	..
	INDIANA																		
19	Indiana University School of Medicine, Bloomington-Indianapolis	..	3	..	26	1	..	..	2	..	1	1	13	..	1	2	3	..	..
	IOWA																		
20	State University of Iowa College of Medicine, Iowa City	..	4	..	11	2	..	..	..	..	..	2	9	..	6	1	..	..	..
	KANSAS																		
21	University of Kansas School of Medicine, Lawrence-Kansas City	..	..	3	7	5	1	..	..	..	..	..	4	1	2	..	..	1	..
	KENTUCKY																		
22	University of Louisville School of Medicine	..	1	1	8	1	1	..	..	..	3	1	2	12	1	1	2	5	..
	LOUISIANA																		
23	Louisiana State University School of Medicine, New Orleans	1	..	1	6	..	1	..	..	..	..	1	1	..	1	..	1	..	..
24	Tulane University of Louisiana School of Medicine, New Orleans	5	1	2	12	..	..	..	2	..	4	..	2	1	1	3	1	3	..
	MARYLAND																		
25	Johns Hopkins University School of Medicine, Baltimore	..	..	2	16	..	4	..	3	..	3	..	3	..	1	3	4	1	..
26	University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore	1	..	..	11	..	1	2	5	..	8	..	4	1	..	2	..	1	1
	MASSACHUSETTS																		
27	Boston University School of Medicine	1	..	..	5	1	8	1	2	..	1	..	..	..	..	1	1	1	1
28	Harvard Medical School, Boston	..	..	..	23	2	7	..	2	..	3	..	5	2	..	5	2	3	3
29	Tufts College Medical School, Boston	..	..	1	11	..	10	..	1	..	1	1	9	1	2	1	..	2	6
	MICHIGAN																		
30	University of Michigan Medical School, Ann Arbor	..	2	..	26	2	1	..	1	..	1	..	7	4	3	1	1	1	..
31	Wayne University College of Medicine, Detroit	..	1	2	13	..	3	..	..	..	..	..	3	..	..	..	1	..	..
	MINNESOTA																		
32	University of Minnesota Medical School, Minneapolis	..	7	1	40	7	..	..	..	..	..	2	1	3	5	3	..	1	..
	MISSOURI																		
33	St. Louis University School of Medicine	1	..	1	14	1	..	..	..	..	..	..	8	4	2	2	1	2	..
34	Washington University School of Medicine, St. Louis	..	3	2	17	4	1	..	2	..	..	2	8	1	2	8	1	3	..
	NEBRASKA																		
35	Creighton University School of Medicine, Omaha	..	3	..	7	..	..	..	..	..	..	..	1	2	5	..	1	..	..
36	University of Nebraska College of Medicine, Omaha	1	3	..	23	5	..	..	..	..	1	..	3	2	10	2	1	..	..
	NEW YORK																		
37	Albany Medical College	1	..	..	4	..	4	..	1	..	1	..	2	1	..	1	2	..	..
38	State University of New York College of Medicine at New York City	..	..	..	20	1	13	..	3	..	1	..	1	..	1	..	..	..	..
39	Univers	..	..	..	7	1	2	..	2	..	..	..	3	2	..	1	1	1	..
40	Columb	..	..	..	17	1	17	..	3	..	1	1	2	1	1	3	5	1	1
41	Cornell	..	..	1	10	1	8	..	1	..	1	..	1	..	..	1	..	..	2
42	New Y New Yorl	..	..	..	5	..	16	1	2	..	..	..	3	1	..	1	2	..	2
43	New York	..	..	1	30	1	13	..	2	..	1	..	2	2	..	1	1	2	..
44	University	..	1	..	10	3	1	..	1	..	1	1	1	1	2	2	..	..	..
45	State Univ	2	..	..	3	..	2	..	..	..	..	..	1	1	..	..	..	..	..
	NORTH CAROLINA																		
46	Duke University School of Medicine, Durham	3	..	1	4	..	3	1	1	..	4	..	1	..	2	..	2	..	..
47	Bowman Gray School of Medicine of Wake Forest College, Winston-Salem	..	..	..	2	..	..	..	..	..	1	..	1	..	..	..	1	..	..
	OHIO																		
48	University of Cincinnati College of Medicine	2	1	..	10	2	1	..	..	..	..	..	3	6	1	1	5	..	..
49	Western Reserve University School of Medicine, Cleveland	..	..	..	22	2	..	..	..	..	..	..	4	1	2	1	..	1	..
50	Ohio State University College of Medicine, Columbus	..	..	..	13	1	2	..	1	..	..	..	4	4	..	..	3	..	..
	OKLAHOMA																		
51	University of Oklahoma School of Medicine, Oklahoma City	1	..	3	8	3	..	..	..	..	2	..	2	..	..	7	..	..	..
	OREGON																		
52	University of Oregon Medical School, Portland	..	..	..	16	..	..	..	..	..	..	2	1	..	1	1	1	..	..
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18

19 Maryland	20 Massachusetts	21 Michigan	22 Minnesota	23 Mississippi	24 Missouri	25 Montana	26 Nebraska	27 Nevada	28 New Hampshire	29 New Jersey	30 New Mexico	31 New York	32 North Carolina	33 North Dakota	34 Ohio	35 Oklahoma	36 Oregon	37 Pennsylvania	38 Rhode Island	39 South Carolina	40 South Dakota	41 Tennessee	42 Texas	43 Utah	44 Vermont	45 Virginia	46 Washington	47 West Virginia	48 Wisconsin	49 Wyoming	50 Alaska, Hawaii, Puerto Rico and Virgin Islands	51 Totals	Marginal Number
..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	1	..	2	..	..	2	..	..	..	1	..	..	..	..	17	1
..	..	3	..	3	2	..	1	..	..	..	1	2	2	..	..	7	..	..	..	..	..	2	9	..	..	2	..	1	..	..	..	60	2
2	..	3	..	..	..	..	..	..	..	1	..	3	..	..	2	1	..	2	..	..	..	..	..	..	..	..	2	..	..	..	..	23	3
2	1	3	2	3	3	1	1	..	..	..	..	2	1	..	3	1	6	1	..	..	..	6	3	..	..	..	5	2	..	1	5	79	4
..	..	..	3	..	1	..	..	1	..	..	1	1	..	..	..	..	..	..	..	..	..	2	..	1	..	..	..	..	1	..	..	17	5
..	..	2	..	..	..	1	..	1	..	..	..	4	..	..	1	..	1	..	..	..	..	..	1	1	..	..	1	..	1	..	..	24	6
1	..	1	2	..	1	2	..	1	..	..	2	4	1	..	1	..	4	1	..	..	1	..	2	2	..	..	1	1	..	3	..	58	7
4	11	2	..	..	3	..	..	..	1	2	..	7	..	..	6	1	..	5	1	..	..	2	2	..	..	1	2	..	..	..	..	91	8
17	6	..	..	..	..	..	..	..	..	12	..	15	1	..	5	..	..	12	1	1	..	..	1	..	..	11	..	..	..	..	2	128	9
14	2	2	4	..	2	..	1	..	..	4	1	6	5	..	5	..	..	4	1	..	..	1	3	1	..	12	5	1	2	..	2	127	10
..	2	3	1	1	..	..	..	..	..	2	..	7	2	..	1	..	..	5	..	..	..	..	..	..	..	2	..	..	1	..	2	48	11
1	2	..	1	..	..	..	..	..	..	..	..	2	3	..	..	..	..	..	..	4	..	4	6	..	..	2	..	1	..	..	..	38	12
6	..	1	2	1	1	..	..	..	..	..	1	2	6	..	3	1	..	..	..	2	..	3	2	..	..	3	..	..	..	..	..	45	13
..	..	..	..	1	..	1	..	..	..	1	..	6	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	18	14
2	..	8	3	..	6	3	3	..	1	1	4	4	..	..	5	4	4	4	..	1	1	3	10	1	..	..	8	..	1	2	4	175	15
..	..	6	2	..	..	..	2	..	..	2	3	1	..	..	4	1	1	..	..	..	..	1	6	..	..	..	..	..	2	..	1	64	16
2	..	4	2	..	..	1	1	..	..	1	1	5	1	1	2	1	1	3	1	..	..	..	2	3	..	..	3	1	3	..	1	71	17
..	..	9	1	..	8	1	1	..	1	..	..	4	1	1	5	1	3	3	..	..	1	..	5	1	..	1	3	3	11	2	..	173	18
8	2	9	6	..	1	..	1	..	..	2	1	6	..	2	8	2	1	6	..	1	..	1	11	1	..	..	2	1	2	1	2	125	19
1	..	2	5	..	3	1	..	1	..	1	..	2	..	2	4	1	2	1	..	..	..	2	2	..	..	1	5	..	3	2	1	77	20
1	1	6	..	..	21	1	1	1	..	1	1	..	..	..	2	2	..	..	..	..	2	..	12	..	..	..	1	2	..	..	..	79	21
1	1	5	5	2	3	..	..	1	..	1	..	7	2	..	7	..	..	5	..	..	1	4	8	..	..	3	2	4	1	..	1	103	22
1	1	..	1	5	2	..	..	..	1	..	..	1	2	..	1	..	..	..	..	..	..	1	8	..	..	..	..	..	..	..	..	37	23
1	1	2	1	8	3	1	..	..	..	2	3	8	2	..	3	2	2	1	..	3	..	4	25	..	..	2	2	1	1	1	1	117	24
3	8	5	..	2	3	..	..	..	2	2	1	13	2	..	6	1	..	6	..	1	..	..	2	2	..	6	3	2	1	..	..	106	25
2	1	3	1	..	..	..	..	..	..	2	..	10	..	..	4	..	2	7	1	4	..	..	3	1	..	7	..	4	..	..	1	90	26
2	31	2	1	..	..	..	..	..	4	2	..	20	1	..	2	1	..	5	2	..	..	..	2	..	..	1	1	..	1	..	..	101	27
6	44	11	6	1	4	..	..	..	3	4	1	37	3	..	11	1	1	8	3	1	..	2	1	1	..	2	2	..	2	..	2	214	28
1	69	3	3	..	2	..	..	..	5	3	1	6	..	..	4	..	..	2	8	..	..	..	2	..	1	4	..	..	..	..	..	150	29
1	1	1	2	2	5	..	..	1	..	2	1	7	3	..	15	..	2	7	..	1	1	1	2	2	..	3	2	2	6	..	..	120	30
1	1	1	1	1	1	1	..	..	..	..	1	2	1	..	1	..	..	1	..	..	..	..	1	..	..	3	..	..	1	..	1	42	31
..	..	2	5	..	1	2	2	1	..	2	1	6	2	1	8	2	6	2	..	..	6	2	6	..	..	..	5	2	7	..	..	136	32
1	2	6	5	1	1	3	..	..	..	3	..	4	..	..	18	1	1	..	2	..	..	2	11	1	..	..	8	1	2	..	3	112	33
1	..	5	3	3	3	1	1	..	..	..	1	2	1	..	10	1	2	1	1	..	..	1	7	..	..	..	11	1	..	2	1	113	34
..	..	4	2	..	2	..	6	..	..	1	..	4	..	..	1	..	1	2	..	..	..	1	..	..	..	..	4	..	..	..	..	47	35
1	1	5	4	..	2	2	3	..	..	2	1	4	..	2	6	1	3	1	..	1	4	1	2	1	..	2	8	..	..	2	..	110	36
..	2	..	..	..	..	..	..	..	..	4	..	38	..	..	2	..	..	1	..	..	..	..	..	..	1	..	1	..	..	..	..	46	37
..	1	2	..	..	1	..	1	1	1	18	2	59	1	..	5	..	..	8	..	..	..	..	2	2	1	1	1	1	..	..	..	148	38
..	6	2	4	..	1	..	..	..	1	2	..	51	2	..	5	..	..	2	..	..	..	..	..	..	1	1	1	2	..	..	..	100	39
3	7	3	2	..	2	..	2	..	4	23	2	79	3	..	4	..	1	5	..	2	..	2	..	..	..	..	4	..	1	..	1	204	40
2	2	2	1	..	3	..	1	..	..	18	1	24	3	..	5	1	1	5	..	..	..	1	3	..	1	3	3	1	..	..	..	107	41
1	5	3	2	..	..	..	..	..	..	19	..	50	..	1	7	1	..	5	..	..	1	..	3	..	..	..	..	1	2	1	..	135	42
1	2	3	1	..	..	1	..	..	2	21	..	72	3	..	8	2	..	10	2	..	..	1	3	..	..	3	1	2	2	..	1	197	43
..	8	3	1	..	2	..	..	..	1	3	..	27	..	..	4	..	1	2	..	1	..	1	2	2	..	3	2	..	..	..	..	82	44
..	2	4	3	..	1	..	..	..	2	1	..	17	..	..	2	..	..	3	..	..	..	..	1	..	1	..	..	..	..	..	..	46	45
4	..	5	2	..	..	..	..	..	..	1	1	5	8	..	5	..	..	2	..	4	..	..	..	..	1	4	..	1	1	..	2	68	46
..	..	2	..	..	..	..	..	..	..	1	..	2	..	..	..	..	..	2	..	4	..	..	..	1	..	2	..	..	..	..	..	19	47
1	3	6	2	..	..	..	..	1	..	..	2	2	2	..	..	..	..	4	..	..	..	1	4	..	..	1	1	2	..	..	..	64	48
1	2	5	1	1	1	..	1	..	..	2	1	2	..	..	1	..	..	2	..	..	1	..	5	1	..	1	1	1	1	..	1	65	49
1	1	5	1	..	2	..	..	..	..	..	2	1	..	..	..	..	2	4	..	2	..	..	1	..	..	2	1	..	..	..	..	53	50
..	1	2	3	..	2	..	1	1	1	1	2	1	..	..	2	..	2	..	..	..	..	1	10	..	..	..	2	..	1	..	..	59	51
1	..	..	2	..	1	2	..	..	..	1	..	1	..	..	..	..	11	..	..	..	1	..	1	..	..	..	10	..	1	..	1	55	52
19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	

TABLE 11.—CANDIDATES LICENSED BY

Marginal Number	SCHOOL	1 Alabama	2 Arizona	3 Arkansas	4 California	5 Colorado	6 Connecticut	7 Delaware	8 Dist. of Columbia	9 Florida	10 Georgia	11 Idaho	12 Illinois	13 Indiana	14 Iowa	15 Kansas	16 Kentucky	17 Louisiana	18 Maine
	PENNSYLVANIA																		
53	Hahnemann Medical College and Hospital of Philadelphia	1	1	..	14	..	1	..	..	..	1	..	..	1	..	..	..	1	..
54	Jefferson Medical College of	..	2	2	18	..	6	1	5	..	1	2	3	4	2	1	2	4	..
55	Temple University School of	..	..	1	12	2	2	1	1	..	..	..	4	1	1	..	3	1	..
56	University of Pennsylvania Sc	..	3	2	18	1	4	2	3	..	..	1	2	2	1	..	..	2	1
57	Woman's Medical College of Pennsylvania, Philadelphia	..	..	..	2	2	2	1	..	..	1	..	2	..	..	..	..	..	..
58	University of Pittsburgh School of Medicine	..	1	..	6	2	1	..	..	..	1	..	1	1	1	2	1	1	..
	SOUTH CAROLINA																		
59	Medical College of South Carolina, Charleston	1	..	..	3	..	..	..	..	..	4	..	..	..	..	..	..	..	..
	TENNESSEE																		
60	University of Tennessee	8	1	9	11	2	1	..	2	..	5	..	2	..	..	2	11	7	..
61	Meharry Medical College	1	..	..	2	..	1	..	1	..	2	..	..	1	..	1	..	..	..
62	Vanderbilt University Sc	5	..	4	6	..	..	..	..	..	1	..	2	..	..	..	4	4	1
	TEXAS																		
63	Southwestern Medical School of the University of Texas, Dallas	..	..	..	5	..	..	..	..	..	..	..	1	..	..	..	..	2	..
64	University of Texas School of Medicine, Galveston	..	1	..	6	..	..	..	2	..	1	..	2	1	..	..	1	2	..
65	Baylor University College of Medicine, Houston	..	1	..	6	1	1	..	1	..	..	..	1	..	..	..	1	3	..
	UTAH																		
66	University of Utah School of Medicine, Salt Lake City	..	..	..	6	..	..	..	..	..	..	3	1	..	..	..	..	..	..
	VERMONT																		
67	University of Vermont College of Medicine, Burlington	1	..	..	4	..	3	..	1	..	..	..	1	..	..	..	..	..	4
	VIRGINIA																		
68	University of Virginia Department of Medicine, Charlottesville	2	..	1	8	1	3	1	3	..	4	..	1	..	1	1	1	3	1
69	Medical College of Virginia, Richmond	1	..	..	4	..	1	..	4	..	3	..	..	1	..	..	2	1	..
	WASHINGTON																		
70	University of Washington School of Medicine, Seattle	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	WISCONSIN																		
71	University of Wisconsin Medical School,	..	..	..	7	..	..	..	..	..	..	..	3	2	1	2	1	..	..
72	Marquette University School of Medicine	1	..	..	16	1	1	..	..	..	..	..	5	2	2	1	..	1	..
	CANADA																		
73	University of Alberta Faculty of Medicine, Edmonton	..	..	..	2	..	..	..	..	..	..	1	..	..	..	..	1	..	..
74	University of Manitoba Faculty of Medicine, Winnipeg	..	..	..	1	..	..	..	1	..	..	..	..	..	1	..	..	1	..
75	Dalhousie University Faculty of Medicine, Halifax	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
76	Queen's University Faculty of Medicine, Kingston	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
77	University of Ottawa Faculty of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
78	University of Western Ontario Faculty of Medicine, London	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
79	University of Toronto Faculty of Medicine	..	1	..	5	..	1	..	..	..	..	..	..	..	..	..	..	..	..
80	McGill University Faculty of Medicine, Montreal	..	..	1	9	..	3	..	2	..	..	1	1	1	2	..	..	..	..
81	University of Montreal Faculty of Medicine	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..
82	Laval University Faculty of Medicine, Quebec	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	OTHERS																		
83	Foreign Medical Faculties	1	..	..	1	..	6	1	8	..	1	..	..	1	1	..	1	..	2
84	Extinct Medical Schools	..	3	..	20	..	2	1	..	..	1	1	2	1	1	3	2	1	..
85	Unapproved Medical Schools	..	2	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	1
86	Schools of Osteopathy	..	..	..	..	..	..	1	1	..	..	..	..	9	..	..	..	..	..
87	TOTALS	59	60	46	844	84	195	15	139	0	80	35	203	125	85	93	82	85	30
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18

Increases in the physician population arranged in nine geographic divisions in the United States are shown in table 13. The East North Central and Middle Atlantic group of states had the greatest number of first licentiates, 1,285 and 1,244 respectively. More than 600 were added in four other groups—West North Central, 698; South Atlantic, 887; West South Central, 663; and the Pacific states, 633. The New England states added 320, the East South Central states, 420, the Mountain states 132, and the territories and outlying possessions, 43.

In the past 17 years (1935-1951) there have been 105,401 physicians added to the medical profession as determined by the number who received licenses for the first time. Figures for each year during this period are presented in table 14. Of the 105,401 additions, 90,526 were licensed after a successful written examination and 14,875 by reciprocity or endorsement of credentials. The total number of licenses issued in the same period was 180,152.

Estimated figures indicate that on Dec. 31, 1951, the total number of physicians in continental United States was 211,680, of whom 150,710 were estimated as in private practice. The figure includes 59,970 licensed physicians engaged in full-time research, teaching, and administration. It also includes physicians who have retired, interns and residents in hospitals, and those in the government services.

Registration of Physicians, 1904-1951

A recapitulation of totals for 1951 and for all years since 1904 is included in table 15. This tabulation includes for each year the number of physicians examined and registered by written examination, the annual percentage of failures, the number registered annually by reciprocity or endorsement of credentials, and the total registered. The total number of physicians registered from 1904 to 1933 remained somewhat constant except in 1918 when 4,231 were licensed, the lowest registration in 48 years. This decrease was due to a sudden withdrawal of physicians from civilian life in World War I. After 1933 there was an upward trend for a time, followed by a decline in the years 1940 to 1943 inclusive. There was a noticeable increase in 1943 as the result of the accelerated medical school curriculum and the efforts made to maintain civilian care during World War II at as high a level as possible while still providing for the needs of the military. In 1943 more physicians were registered than in any previous year.

19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	
Maryland	Massachusetts	Michigan	Minnesota	Mississippi	Missouri	Montana	Nebraska	Nevada	New Hampshire	New Jersey	New Mexico	New York	North Carolina	North Dakota	Ohio	Oklahoma	Oregon	Pennsylvania	Rhode Island	South Carolina	South Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	West Virginia	Wisconsin	Wyoming	Alaska, Hawaii, Puerto Rico and Virgin Islands	Totals	Marginal Number
2	4	..	1	..	1	..	..	..	1	11	1	21	..	3	4	..	1	29	2	1	..	3	1	..	..	2	..	2	..	..	..	110	53
2	3	1	3	1	1	2	..	..	1	15	..	11	4	..	12	2	2	18	..	1	..	2	1	..	1	3	1	2	4	..	3	149	54
3	3	3	4	..	1	1	..	1	..	14	1	10	2	1	4	1	3	19	..	..	1	1	4	1	..	1	5	4	..	..	1	118	55
1	4	6	..	3	1	..	..	..	2	15	1	13	8	..	9	1	..	22	..	1	1	2	8	1	..	4	..	2	..	1	..	148	56
..	..	..	..	..	1	..	..	..	..	7	1	4	1	..	2	..	1	9	..	..	..	..	2	..	..	..	1	..	1	..	..	40	57
..	1	2	2	..	1	..	..	..	..	..	..	5	..	..	9	1	1	5	..	..	..	2	5	1	..	2	..	4	5	1	..	65	58
1	2	..	..	..	1	..	..	..	..	4	..	1	6	..	..	..	..	1	1	..	..	..	2	1	..	5	..	..	..	..	..	33	59
2	..	5	..	6	4	..	..	..	..	1	3	3	2	..	4	1	2	2	..	1	..	5	17	2	..	2	1	..	1	..	..	125	60
..	..	2	..	2	1	..	1	..	..	..	..	3	3	..	3	2	..	1	..	3	..	1	2	..	..	..	..	..	2	..	..	35	61
..	1	2	1	1	1	..	..	..	..	..	..	1	1	..	4	1	..	..	..	4	..	1	3	1	..	..	1	2	..	..	..	52	62
..	..	1	1	1	2	..	..	..	..	..	1	3	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	20	63
1	..	3	4	..	3	..	..	..	..	2	1	..	1	..	2	4	1	2	..	..	..	1	..	..	..	1	..	..	..	..	..	42	64
..	1	..	3	..	2	..	1	..	..	1	1	1	..	..	1	..	..	..	..	..	..	1	2	..	..	..	1	..	..	..	2	32	65
..	..	1	..	..	..	1	..	1	..	..	..	1	..	..	2	..	1	..	..	..	..	..	..	4	..	..	1	1	..	1	..	24	66
4	11	1	..	..	..	..	..	..	..	3	..	8	1	..	6	..	..	3	..	..	..	..	1	..	3	..	..	..	..	..	..	55	67
5	4	..	2	..	2	3	..	..	..	2	..	5	9	..	..	..	..	5	..	3	..	2	6	..	..	1	1	4	1	..	..	86	68
8	3	2	5	..	..	1	..	..	..	4	1	3	8	..	6	..	..	..	..	4	..	1	6	..	..	7	..	8	1	..	1	81	69
..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	2	70
2	..	5	..	..	1	1	..	..	..	1	..	3	..	1	1	..	1	3	..	..	..	1	1	..	..	2	..	..	6	..	1	46	71
..	1	5	4	..	1	1	..	..	..	1	..	11	..	1	3	..	..	1	2	1	1	..	1	..	..	1	2	1	3	..	..	71	72
..	..	..	1	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	8	73
..	..	..	..	..	..	..	..	..	..	..	1	2	..	..	..	1	1	..	..	..	1	..	..	..	..	..	1	..	..	..	..	11	74
..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	2	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	4	75
1	..	..	..	..	..	..	..	..	..	..	..	2	..	..	2	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	6	76
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	77
..	..	2	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	1	..	..	6	78
..	4	1	1	2	..	..	..	..	..	..	..	5	1	..	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	23	79
..	3	1	3	..	1	..	..	..	2	1	1	5	1	..	..	..	..	..	..	..	..	1	2	..	..	..	1	1	..	..	1	44	80
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	81
..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	3	82
..	2	..	..	..	3	1	..	..	4	16	1	18	..	..	27	1	..	..	..	..	..	2	1	..	1	1	2	..	1	..	4	108	83
2	..	4	..	2	..	1	..	..	1	..	..	3	1	..	1	..	..	1	..	1	..	..	4	1	..	1	..	1	2	1	..	65	84
..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	45	..	..	..	..	..	1	..	1	52	85
..	6	..	..	..	..	..	..	..	..	6	..	..	..	..	8	..	..	..	..	..	1	..	15	..	..	..	..	..	..	..	..	47	86
122	264	214	134	53	128	38	33	13	41	275	54	771	113	16	312	53	75	272	28	55	25	79	325	37	13	123	136	73	87	23	50	6,295	87
19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	

The number registered in 1946 was almost double the number registered in 1945 and was greater than in any previous year. Separation from service of a large number of medical officers and their subsequent licensure by endorsement of credentials indicating their return to private practice in states other than those in which they were licensed accounts in large part for this increase. This increase in part was occasioned by the licensure of recent graduates who had entered military service on completion of the internship and before securing state licensure.

In the years since 1946 the numbers registered have annually decreased, although they far exceed the prewar totals. It may be anticipated that the figures will increase as the result of the increased enrollments in the medical schools of the country.

In 1904, the first year shown, the percentage of failures was 19.3. This was an era of proprietary medical schools. Beginning in 1913 the percentage of failures gradually dropped each year until 1930, when 5.7% failed. Beginning in 1936 the percentage of failures began to rise, reaching another peak of 20.7% in 1940. This was the result of the increase in the number of foreign-trained physicians seeking licensure in the United States, many of whom are not successful after repeated attempts at licensure examinations. Since 1944 the percentage of failures has been dropping owing perhaps to a decrease in the number of foreign-trained physicians examined as contrasted with the prewar years and also the fact that there are fewer graduates of unapproved medical schools seeking licensure. There has been no unapproved medical school in operation since 1948.

This table again refers to examinations given annually rather than persons examined.

Candidates Examined for Medical Licensure, 1947-1951

In table 16 are tabulated the number of candidates examined for medical licensure in the United States and its territories and outlying possessions for the five year period 1947-1951. For each year there is recorded the number who passed and failed licensing examinations. Totals for the five years and the percentage of failures for five years are also given.

In the five year period shown 32,427 examinations were given; 28,734 were successful tests and 3,693, or 11.4%, resulted in failures. New York leads in the number of examinations given. In this state 4,060 were examined of whom 1,984, or 48.8%, failed. More than

2,000 examinations were also given in California and Illinois and more than 1,000 were given in Florida, Minnesota, Missouri, Ohio, Pennsylvania, and Texas.

The greatest percentage of failures, 66.2%, occurred in Massachusetts. The majority of those who failed in this state represent graduates of unapproved medical schools and schools of osteopathy. The number of failures in this state, however, is decreasing since the unapproved schools whose graduates the licensing board was required by law to examine are no longer in operation. The State Approving Authority has furthermore ruled that students matriculating after Jan. 1, 1941, in institutions not meeting the standards of this authority will not be eligible for licensure.

TABLE 12.—*Licentiates Representing Additions to the Medical Profession, 1951*

	Examination	Reciprocity and Endorsement	Total
Alabama	67	6	73
Arizona	9	1	10
Arkansas	79	0	79
California	450	76	526
Colorado	76	7	83
Connecticut	30	63	93
Delaware	6	0	6
District of Columbia	27	55	82
Florida	94	0	94
Georgia	118	5	123
Idaho	7	0	7
Illinois	389	48	437
Indiana	113	7	120
Iowa	75	8	83
Kansas	92	7	99
Kentucky	101	2	103
Louisiana	213	0	213
Maine	11	3	14
Maryland	167	16	183
Massachusetts	19	151	170
Michigan	193	30	223
Minnesota	131	24	155
Mississippi	76	4	80
Missouri	224	12	236
Montana	3	0	3
Nebraska	95	6	101
Nevada	0	0	0
New Hampshire	3	16	19
New Jersey	50	63	113
New Mexico	0	0	0
New York	264	479	743
North Carolina	123	13	136
North Dakota	16	1	17
Ohio	346	48	394
Oklahoma	74	0	74
Oregon	39	9	48
Pennsylvania	274	114	388
Rhode Island	12	8	20
South Carolina	62	2	64
South Dakota	6	1	7
Tennessee	162	2	164
Texas	291	6	297
Utah	24	1	25
Vermont	2	2	4
Virginia	165	15	180
Washington	47	12	59
West Virginia	16	3	19
Wisconsin	111	0	111
[illegible]	4	0	4
[illegible] Rico, Virgin Islands	29	14	43
Totals	4,985	1,340	6,325

New York had a percentage failure in the five year period of 48.8 and California's percentage of failures was 29.9. These states examine a considerable number of graduates of foreign medical schools, many of whom do not pass their first examination. Regulations permitting certain graduates of unapproved and osteopathic schools to the licensure examination in New York also contributed to its high percentage of failures.

In summary, 3 states had more than 29% failures in five years; 5 states had more than 10%, 10 states more than 5%, and 26 states less than 5%. Six states, Kentucky, Missouri, Tennessee, Washington, West Virginia, and Wyoming, had no failures in five years.

The annual percentage of failures for all boards has varied from 10.5% to 12.5%. The highest percentage was in 1949.

TABLE 13.—*Licentiates Representing Additions to the Medical Profession Grouped in Geographic Divisions, 1951*

	Examination	Reciprocity and Endorsement	Total
New England			
Maine	11	3	14
New Hampshire	3	16	19
[illegible]	2	2	4
[illegible]	19	151	170
[illegible]	12	8	20
[illegible]	30	63	93
	77	243	320
Middle Atlantic			
New York	264	479	743
New Jersey	50	63	113
Pennsylvania	274	114	388
	588	656	1,244
East North Central			
Ohio	346	48	394
Indiana	113	7	120
Illinois	389	48	437
Michigan	193	30	223
Wisconsin	111	0	111
	1,152	133	1,285
West North Central			
Minnesota	131	24	155
Iowa	75	8	83
[illegible]	224	12	236
[illegible]	16	1	17
[illegible]	6	1	7
Nebraska	95	6	101
Kansas	92	7	99
	639	59	698
South Atlantic			
[illegible]	6	0	6
[illegible]	167	16	183
[illegible]	27	55	82
[illegible]	165	15	180
[illegible]	16	3	19
[illegible]	123	13	136
South Carolina	62	2	64
Georgia	118	5	123
Florida	94	0	94
	778	109	887
East South Central			
Kentucky	101	2	103
Tennessee	162	2	164
Alabama	67	6	73
Mississippi	76	4	80
	406	14	420
West South Central			
Arkansas	79	0	79
Louisiana	213	0	213
Oklahoma	74	0	74
Texas	291	6	297
	657	6	663
Mountain			
Montana	3	0	3
Idaho	7	0	7
Wyoming	4	0	4
Colorado	76	7	83
New Mexico	0	0	0
Arizona	9	1	10
Utah	24	1	25
Nevada	0	0	0
	123	9	132
Pacific			
Washington	47	12	59
Oregon	39	9	48
California	450	76	526
	536	97	633
Territories and Possessions Alaska, Canal Zone, Guam, Hawaii, Puerto Rico, and Virgin Islands	29	14	43
Totals	4,985	1,340	6,325

The foregoing figures represent examinations give and not persons examined. A candidate who fails mor than once in a state in a given year is counted as on failure, but, should he again fail in a succeeding yea this fact is computed among the failures for that year. In compiling the tabulations in this study, a successful candidate securing a license in more than one state in a given year is counted in both states and also counted if he passed at examinations in later years. The totals in this table give only a fair approximation of the numbers of physicians added to the profession after written examination during the last five years. Table 12 gives the exact compilation of the number of physicians who constitute new additions to the medical profession.

Graduates of Approved Schools and Others Registered, 1922-1951

In table 17, the numbers of physicians registered are grouped in two categories, namely, graduates of approved medical schools and others. In the computation of these figures, schools rated as Class A and B by the Council on Medical Education and Hospitals of the American Medical Association since 1907 are classified as approved. In the column headed "Others" are included persons who graduated prior to 1907 when the first classification of medical schools was made by the Council, graduates of foreign faculties of medicine, Class C graduates, osteopaths given recognition by medical licensing boards, and graduates of schools not approved by the Council. In 1928 the classification of medical schools in categories of A, B, and C by the Council was discontinued, and a list of approved medical schools has since been maintained. Medical schools not meeting the standards of the Council since 1928 have been considered as unapproved institutions.

TABLE 14.—*Licentiates Representing Additions to the Medical Profession, 1935-1951*

	Examination	Reciprocity and Endorsement	Total
1935	5,099	411	5,510
1936	5,548	629	6,177
1937	5,812	612	6,424
1938	5,759	501	6,260
1939	5,584	460	6,044
1940	5,432	455	5,887
1941	5,241	474	5,715
1942	5,560	454	6,014
1943	5,586	372	5,958
1944	6,495	470	6,965
1945	4,979	769	5,748
1946	5,362	1,608	6,970
1947	5,273	1,617	6,890
1948	4,942	1,694	6,636
1949	4,260	1,616	5,876
1950	4,609	1,393	6,002
1951	4,985	1,340	6,325
Totals	90,526	14,875	105,401

In 1951 there were 12,011 candidates registered, of whom 11,097 (92.3%) represented graduates of approved schools and 914 (7.7%) were in the second group. In the 30 years recorded in this table, 273,025 were registered, including 245,795 approved graduates, 90%, and 27,230 others, 10%.

Graduates of Unapproved Medical Schools Registered, 1947-1951

Graduates of institutions which were classified by the Council on Medical Education and Hospitals of the American Medical Association as unapproved were registered in 25 states, the District of Columbia, and the territories and outlying possessions in the past five years. Figures are reported separately in table 18 for those licensed after written examination and those licensed by reciprocity or endorsement of credentials. The table also includes a column combining the figures for these two groups. In the main they represent five schools more recently in operation, all but one of which is now closed. The latter institution has obtained the status of an approved institution. At the present time there is no medical school in operation which is not approved by the Council.

There were 750 graduates of unapproved medical schools registered in the five year period (1947-1951), 675 by examination and 75 by endorsement of credentials. In 1951 there were 75 licensed in 12 states and the territories, 23 by examination and 52 by reciprocity.

TABLE 15.—*Registration of Physicians, 1904-1951*

Year	Examined	Passed	Percentage Failed	Reciprocity and Endorsement	Total Registered
1904	7,056	5,693	19.3	1,005	6,698
1905	7,178	5,688	20.8	394	6,082
1906	8,040	6,373	20.7	1,502	7,875
1907	7,279	5,731	21.3	1,427	7,158
1908	7,775	6,089	21.7	1,284	7,373
1909	7,295	5,865	19.6	1,381	7,246
1910	7,011	5,719	18.4	1,640	7,359
1911	6,964	5,582	19.8	1,243	6,825
1912	6,880	5,467	20.5	1,273	6,740
1913	6,453	5,253	18.6	1,292	6,545
1914	5,579	4,379	21.5	1,439	5,818
1915	5,334	4,507	15.5	1,399.	5,906
1916	4,878	4,151	14.9	1,353	5,504
1917	4,754	4,085	14.0	1,360	5,445
1918	3,667	3,184	13.2	1,047	4,231
1919	4,750	4,074	14.2	2,546	6,620
1920	4,796	4,062	15.3	2,558	6,620
1921	4,825	4,228	12.4	2,186	6,414
1922	4,031	3,539	12.2	2,073	5,612
1923	4,727	4,028	14.8	2,405	6,433
1924	5,392	4,756	11.8	1,923	6,679
1925	6,002	5,450	9.2	1,861	7,311
1926	5,770	5,314	7.9	1,955	7,269
1927	5,389	5,002	7.2	2,176	7,178
1928	5,458	5,090	6.7	2,228	7,318
1929	5,629	5,282	6.2	2,420	7,702
1930	5,571	5,255	5.7	2,366	7,621
1931	5,611	5,263	6.2	2,211	7,476
1932	5,675	5,247	7.6	1,886	7,133
1933	5,673	5,244	7.6	1,989	7,233
1934	6,145	5,628	8.4	2,161	7,789
1935	6,443	5,859	9.1	2,194	8,053
1936	6,918	6,224	10.0	2,773	8,997
1937	7,334	6,604	10.0	3,205	9,809
1938	7,461	6,589	11.7	2,956	9,545
1939	7,754	6,493	16.3	2,872	9,365
1940	7,926	6,291	20.7	2,866	9,157
1941	7,539	6,057	19.7	2,762	8,819
1942	7,223	6,120	15.4	2,469	8,589
1943	8,403	7,489	10.9	2,340	9,829
1944	6,817	6,011	11.8	2,596	8,607
1945	5,930	5,343	9.9	3,622	8,965
1946	7,610	6,856	9.9	9,669	16,525
1947	7,164	6,414	10.5	7,701	14,115
1948	6,624	5,904	10.8	7,595	13,499
1949	5,963	5,219	12.5	6,929	12,148
1950	6,203	5,481	11.6	6,755	12,236
1951	6,473	5,716	11.7	6,295	12,011

Illinois, which accepted for licensure the graduates of one school not approved by the Council until late in 1948, Florida, New York, and Texas, which have made certain concessions, and Massachusetts licensed the largest number of graduates of unapproved medical schools. In the latter state, the institutions referred to in the table were not granted approval by the State Approving Authority. Matriculants after Jan. 1, 1941, are not eligible for licensure. The number being licensed in all of these states was greatly decreased in 1950 and 1951.

Graduates of Schools of Osteopathy Registered by Medical Examining Boards, 1947-1951

The number of graduates of schools of osteopathy granted the privilege of practicing medicine or surgery or both by 18 medical examining boards for five years (1947-1951) is given in table 19. There have been 935 such persons registered, 663 by examination and 272 without written examination. In 1951 there were 202 so registered in 12 states, 155 by examination and 47 by reciprocity.

The situation which obtains in these states providing for the licensure of osteopaths by the medical examining board is as follows. In 1947, Alabama registered a graduate of a school of mechanotherapy. In Colorado, an osteopath receives a license to practice medicine. In Connecticut any registered osteopath may obtain the right to practice medicine or surgery or both according to the type of examination taken. Osteopaths in Delaware may be licensed as osteopathic physicians. The District of Columbia grants osteopaths the privilege of practicing surgery. Under an amendment to the medical practice act in 1945, osteopaths in Indiana are permitted to practice medicine and surgery. Licentiates in osteopathy prior to 1945 are authorized to practice osteopathy, surgery, and obstetrics. In Massachusetts the medical practice act by definition includes osteopathy in the practice of medicine and does not differentiate the type of license issued to an osteopathic physician. A law passed in Nebraska in 1943 provided that osteopaths might make application for a license to practice medicine and surgery by examination if application was made prior to July 1, 1948. In New Hampshire osteopaths are granted the right to practice medicine and surgery.

TABLE 16.—*Candidates Examined, 1947-1951*

	1947		1948		1949		1950		1951		Totals for Five Years		
	P	F	P	F	P	F	P	F	P	F	P	F	% F
Alabama	97	0	16	2	46	1	39	0	60	2	258	5	1.9
Arizona	19	3	17	0	22	0	8	1	14	0	80	4	4.8
Arkansas	54	0	59	0	52	0	74	0	83	4	322	4	1.2
California	503	10	493	36	492	57	513	37	500	54	2,531	194	7.1
Colorado	95	0	72	2	78	0	76	0	84	1	405	3	0.7
Connecticut	49	17	32	7	29	15	29	19	34	16	173	74	29.9
Delaware	20	0	20	0	21	0	23	0	13	1	97	1	1.0
Dist. of Columbia	39	0	33	3	30	1	24	3	27	2	153	9	5.6
Florida	314	17	501	26	308	19	325	46	374	53	1,622	161	9.0
Georgia	129	0	131	1	109	4	147	1	147	0	663	6	0.8
Idaho	62	0	51	0	38	1	1	0	8	0	160	1	0.6
Illinois	605	16	512	44	367	67	399	60	419	91	2,302	278	10.7
Indiana	111	12	99	2	98	4	112	3	116	3	536	24	4.2
Iowa	55	0	67	0	57	0	86	1	81	0	346	1	0.2
Kansas	86	0	67	0	99	1	96	1	92	0	440	2	0.4
Kentucky	90	0	60	0	86	0	88	0	104	0	428	0	0.0
Louisiana	225	1	182	0	164	1	190	1	217	0	978	3	0.3
Maine	31	2	31	3	25	4	19	1	15	6	121	16	11.7
Maryland	175	6	185	8	172	17	183	10	174	14	889	55	5.8
Massachusetts	84	140	65	111	41	92	26	71	35	79	251	493	66.2
Michigan	116	0	181	0	164	0	195	0	221	1	877	1	0.1
Minnesota	248	0	212	1	184	0	201	0	166	0	1,011	1	0.1
Mississippi	59	0	47	0	35	5	64	1	77	0	282	6	2.0
Missouri	265	0	238	0	198	0	206	0	230	0	1,137	0	0.0
Montana	8	0	10	1	8	0	5	0	3	0	34	1	2.9
Nebraska	87	3	84	16	52	4	96	3	96	6	415	32	7.1
Nevada	8	0	3	1	4	1	0	0	0	0	15	2	11.8
New Hampshire	10	0	10	1	7	1	6	1	6	3	39	6	13.3
New Jersey	89	13	90	22	76	9	41	11	54	11	350	66	15.8
New Mexico	1	0	3	0	4	1	2	0	2	0	12	1	7.7
New York	610	482	426	371	411	397	290	397	339	337	2,076	1,984	48.8
North Carolina	113	1	112	0	88	0	97	1	125	1	535	3	0.5
North Dakota	25	0	30	0	24	0	35	3	26	8	140	11	7.3
Ohio	297	3	322	7	262	6	326	19	371	46	1,578	81	4.9
Oklahoma	72	0	59	0	47	1	82	0	66	0	326	1	0.3
Oregon	80	0	48	0	47	4	38	2	42	0	255	6	2.2
Pennsylvania	437	3	448	6	396	3	326	2	277	1	1,884	15	0.7
Rhode Island	32	0	21	0	15	1	12	3	12	0	92	4	4.2
South Carolina	55	0	57	0	43	1	59	0	63	0	277	1	0.3
South Dakota	18	0	27	0	10	0	20	0	23	3	98	3	3.0
Tennessee	148	0	150	0	177	0	142	0	155	0	772	0	0.0
Texas	282	13	262	33	184	10	277	16	305	8	1,310	80	5.7
Utah	0	0	18	0	30	0	29	0	24	1	101	1	1.0
Vermont	27	1	16	0	11	4	15	1	4	0	73	6	7.6
Virginia	130	4	136	4	109	5	138	1	168	2	681	16	2.3
Washington	116	0	110	0	72	0	60	0	54	0	412	0	0.0
West Virginia	40	0	55	0	61	0	42	0	26	0	224	0	0.0
Wisconsin	143	0	182	7	109	0	130	0	132	0	696	7	1.0
Wyoming	0	0	0	0	1	0	2	0	4	0	7	0	0.0
U. S. Territories and Possessions	55	3	54	5	56	7	57	6	48	3	270	24	6.1
Total Examined	7,164		6,624		5,963		6,203		6,473		32,427		
Passed	6,414		5,904		5,219		5,481		5,716		28,734		
Failed	750		720		744		722		757		3,693		
Percentage Failed	10.5		10.8		12.5		11.6		11.7		11.4		

New Jersey provides that osteopaths licensed prior to Nov. 1, 1941, who have served for a period of two years as an intern or resident surgeon in an approved osteopathic or medical hospital, or completed a postgraduate course of two years in a college of osteopathy or medicine approved by the board, or have had at least three years of practice in a hospital approved by the board, can be admitted to an examination in pharmacology, therapeutics, and surgery and if successful can obtain a license to practice medicine and surgery.

In New York a law approved April 10, 1946, provides that any osteopathic licentiate who had obtained the additional right to use instruments for minor surgical procedures and to use anesthetics, antiseptics, narcotics, and biologic products, or any applicant who has met or shall meet all the preliminary and professional requirements as of Sept. 1, 1936, and has satisfactorily passed or shall so pass the regular licensing examination shall be granted the right to practice medicine without limitation.

TABLE 17.—*Graduates of Approved Schools and Others Registered, 1922-1951*

Year	Graduates of Approved Schools		Others		Totals
	Number	Per Cent of Total	Number	Per Cent of Total	
1922	4,519	80.5	1,093	19.5	5,612
1923	5,196	80.8	1,237	19.2	6,433
1924	5,687	85.1	992	14.9	6,679
1925	6,314	86.4	997	13.6	7,311
1926	6,441	88.7	828	11.3	7,269
1927	6,410	89.4	768	10.6	7,178
1928	6,585	90.1	733	9.9	7,318
1929	7,003	91.0	699	9.0	7,702
1930	7,011	92.1	610	7.9	7,621
1931	6,932	92.8	544	7.2	7,476
1932	6,676	92.1	457	6.3	7,133
1933	6,774	93.7	459	6.3	7,233
1934	7,172	92.1	617	7.9	7,789
1935	7,360	91.3	693	8.5	8,053
1936	7,934	88.1	1,063	11.8	8,997
1937	8,391	85.5	1,418	14.4	9,809
1938	8,315	87.1	1,230	12.9	9,545
1939	8,067	86.2	1,298	13.8	9,365
1940	7,781	85.0	1,376	15.0	9,157
1941	7,770	87.9	1,049	11.9	8,819
1942	7,290	84.9	1,299	15.1	8,589
1943	8,640	87.9	1,189	12.2	9,829
1944	7,737	89.8	870	10.1	8,607
1945	8,233	91.8	732	8.1	8,965
1946	15,692	94.9	835	5.1	16,527
1947	13,097	93.0	1,018	7.0	14,115
1948	12,791	94.8	708	5.2	13,499
1949	11,378	93.7	770	6.3	12,148
1950	11,502	94.0	734	6.0	12,236
1951	11,097	92.3	914	7.7	12,011
Totals	245,795	90.0	27,230	10.0	273,025

Osteopaths in Ohio who obtained their licenses under an act passed in 1943 are given the right to practice osteopathic medicine and surgery. In Oregon osteopaths are granted the right to practice in the subjects covered by the examination. In South Dakota, osteopaths may be issued a license to practice osteopathic medicine, surgery, and obstetrics which is an unrestricted license. Texas issues but one license, unrestricted in scope. In Virginia osteopaths may obtain the right to use drugs and perform surgery with the use of instruments. The Wisconsin law as amended in 1950 provides that an osteopath licensed in Wisconsin may obtain a license to practice medicine and surgery by completing a refresher course in materia medica and pharmacology consisting of not less than 64 hours of lecture and 60 hours of laboratory work and by passing an examination in these subjects. Osteopaths not licensed in the state may apply to take the same examination as physicians and if successful will be granted licenses to practice medicine and surgery. In Wyoming the statutes contain no specific provision for the licensing of osteopaths. The medical practice act provides that the certificates issued to all applicants shall be deemed licenses to practice medicine in all branches in which the applicant has taken an examination.

TABLE 18.—*Graduates of Unapproved Medical Schools Registered, 1947-1951*

	Examination						Reciprocity or Endorsement						
	1947	1948	1949	1950	1951	Totals	1947	1948	1949	1950	1951	Totals	Combined Totals
Arizona	..	..	..	..	..	..	..	1	1	..	2	4	4
Arkansas	..	..	..	1	..	1	..	..	..	..	..	..	1
California	..	..	..	2	..	2	..	..	..	5	..	5	7
District of Columbia	..	..	..	..	..	..	..	..	..	1	..	1	1
Florida	11	25	25	16	9	86	..	..	..	..	..	..	86
Georgia	..	..	1	1	1	3	..	..	3	..	1	4	7
Illinois	54	56	41	5	2	158	..	1	..	..	..	1	159
Kentucky	2	..	2	..	..	4	..	..	..	..	..	..	4
Maine	..	..	..	..	..	..	..	..	2	1	1	4	4
Massachusetts	37	26	11	5	4	83	..	..	..	..	..	..	83
Michigan	..	..	..	..	..	..	..	..	..	1	1	2	2
Mississippi	..	3	..	1	1	5	..	..	..	..	..	..	5
Missouri	..	..	..	..	..	..	..	..	..	3	..	3	3
Nebraska	..	..	..	..	..	..	..	1	..	..	..	1	1
	1	..	..	..	..	1	..	..	..	..	..	..	1
	1	..	..	..	..	1	..	..	..	..	..	..	1
New York	132	60	94	7	4	297	..	..	..	..	..	..	297
North Carolina	..	..	..	3	..	3	..	..	..	..	..	..	3
Ohio	4	1	1	1	..	7	..	..	..	..	..	..	7
	..	..	..	1	1	2	..	..	..	..	..	..	2
	..	..	..	..	..	..	..	..	1	..	..	1	1
Texas	..	..	..	..	..	..	..	..	..	2	45	47	47
Virginia	4	1	3	..	..	8	..	..	..	..	..	..	8
Washington	4	1	1	..	..	6	..	..	..	..	..	..	6
West Virginia	..	..	2	..	..	2	..	..	..	..	..	..	2
Wisconsin	..	..	..	..	..	..	..	..	..	..	1	1	1
U. S. Territories and Possessions	..	..	3	2	1	6	..	..	..	..	1	1	7
Totals	250	173	184	45	23	675	0	3	7	13	52	75	750

TABLE 19.—*Graduates of Schools of Osteopathy Registered by Medical Boards, 1947-1951*

	Examination						Reciprocity or Endorsement						
	1947	1948	1949	1950	1951	Totals	1947	1948	1949	1950	1951	Totals	Combined Totals
Alabama	1	..	..	..	..	1	..	..	..	..	..	..	1
Colorado	11	5	5	8	10	39	..	..	..	..	..	..	39
Connecticut	3	..	1	4	1	9	..	..	..	..	..	..	9
Delaware	..	..	..	..	1	1	..	..	1	..	1	2	3
	..	..	..	1	..	1	1	2	1	1	1	6	7
	..	..	3	3	..	6	..	..	1	..	9	10	16
	2	2	..	..	2	6	1	5	3	3	6	18	24
	1	..	1	..	..	2	..	..	..	..	..	..	2
	..	..	..	..	..	..	3	6	4	1	..	14	14
New Jersey	9	3	5	7	2	26	2	3	1	2	6	14	40
New York	134	34	11	34	45	258	75	13	2	3	..	93	351
Ohio	12	21	24	28	46	131	10	12	4	8	8	42	173
Oregon	..	1	..	..	..	1	16	8	5	..	..	29	30
South Dakota	..	..	..	1	..	1	..	..	..	1	1	2	3
Texas	38	33	15	35	87	158	..	1	9	5	15	30	188
Virginia	..	1	..	1	..	2	..	1	..	..	..	1	3
Wisconsin	3	2	1	4	11	21	3	6	1	..	..	10	31
Wyoming	..	..	..	..	..	..	..	..	..	1	..	1	1
Totals	214	102	66	126	155	663	111	57	32	25	47	272	935

Preprofessional Requirements of Licensing Boards

Since 1918 the minimum requirement of the Council on Medical Education and Hospitals of the American Medical Association and the Association of American Medical Colleges has been two years of college training. In 1938 both these agencies recommended that at least three years of college work be required of all candidates for admission. In December, 1951, the Council revised its "Essentials of an Acceptable Medical School." The present requirements are as follows:

1. Collegiate training in preparation for the study of medicine should provide the opportunity for a good general education, including the attainment of competence in English. It should include theoretical and laboratory courses in physics, biology, and inorganic and organic chemistry. At the present time the minimum requirement for admission to approved medical schools is three years of college training for the average student.[2] For most students, four years is recommended in order to provide an opportunity to gain a broad educational experience. Rarely, a school will be justified in admitting a superior student under exceptional conditions after two years of college work.

2. Since it cannot in general be assumed that all who have satisfied these requirements merely in terms of hourly credits are fitted for the study of medicine, it is desirable that qualitative standards with reference to academic performance, character, motivation, and health also be imposed.

3. As a rule candidates should have received their preliminary education in institutions approved by accrediting agencies acceptable to the Council. Exception to this rule may be made in the case of applicants who

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[2] This requirement of three years becomes effective for students entering medical school after Jan. 1, 1953.

have demonstrated superior ability. For the convenience of admitting officers the Council has compiled a list of colleges of arts and sciences approved by regional educational associations.

4. Candidates who have completed three years of collegiate instruction and present evidence of having accomplished work of distinction in one or more fields of learning, but who lack credit in any or all of the required subjects, may be admitted on passing examination in these subjects.[3]

All state licensing boards (table 20) require that an applicant for licensure must present evidence of having completed two years of college. Until 1951, California exacted only a high school education. It initiated a two year requirement in 1951 for present graduates and three years for graduates after Jan. 1, 1955. Six states and Puerto Rico specify a three year college requirement.

Seventy-seven of the 79 medical and basic science schools in the United States require three or more years of premedical study. Five of the Canadian schools have a similar requirement. Nine schools require a bachelor's degree. One of the nine schools requires only three years of college work from veterans, while two of these schools will accept students with three years of college work provided their colleges will grant them a bachelor's degree on the successful completion of the first year of medical school.

TABLE 20.—*Requirements of Preprofessional Training by Medical Licensing Boards*

Two Years or More of College

Alabama
Arizona
Arkansas
California
Colorado
Connecticut
Delaware
District of Columbia
Florida [1]
Georgia
Idaho
Illinois
Indiana
Iowa [1]
Kansas
Kentucky
Louisiana
Maine
Maryland
Massachusetts
Michigan [1]
Minnesota
Mississippi
Missouri
Montana
Nebraska
Nevada
New Hampshire
New Jersey
New Mexico
New York
North Carolina [1]
North Dakota
Ohio
Oklahoma
Oregon
Pennsylvania
Rhode Island
South Carolina [1]
South Dakota
Tennessee [1]
Texas
Utah
Vermont
Virginia
Washington
West Virginia
Wisconsin [1]
Wyoming
Alaska
Canal Zone
Guam
Hawaii
Puerto Rico [1]
Virgin Islands

1. Three year college requirement.

Professional Educational Requirements of Licensing Boards

The medical practice acts or board regulations of several state medical licensing boards specify the length of the medical school course. In other states the law or ruling reads that the professional educational requirement accepted for approval by the Council on Medical Education and Hospitals of the American Medical Association or for membership in the Association of American Medical Colleges, or both, is the regulation for licensure. Table 21 outlines the requirement of each state in this respect. This table does not record the internship, which is a requirement for licensure by 31 boards.

Approval of Medical Schools

Nine states maintain their own list of approved medical schools in the United States and Canada. Six of these states accept the list of medical schools approved by the Council on Medical Education and Hospitals of the American Medical Association and/or the Association of American Medical Colleges. Nineteen boards require applicants for licensure from medical schools in the United States or Canada to be graduates of medical schools approved by the Council. Two boards require membership in the Association of American Medical Colleges. Twenty-nine boards require that schools be approved by the Council and in membership in the Association of American Medical Colleges. In the majority of instances this requirement is specified in the medical practice act or is a formal regulation of the board. In only five instances is it an informal policy.

Required Internships

Only six schools in the United States and four in Canada require that their students complete an internship. These schools are listed in table 22. However, for many years more than 99% of all graduates have voluntarily served an internship, and a majority have had additional hospital training before entering practice.

One year of internship, as a prerequisite to licensure, is required by the licensing boards of 25 states, the District of Columbia, Alaska, Guam, Hawaii, Puerto Rico, and the Virgin Islands. The internship requirement was instituted during the past year by California and Kentucky. It is no longer a requirement in Kansas. Ten boards specify that the internship must be a rotating service. North Dakota, Vermont, Wisconsin and Hawaii, which formerly required a rotating service, now indicate that either a rotating or a straight service is acceptable. Michigan, which requires a rotating service, will accept a 24 month mixed or straight internship in lieu of a rotating service. New Jersey specifies that a two year residency in a specialty or one year of postgraduate work will meet the requirement of a rotating internship service. Alaska will accept active practice for four years in lieu of the internship requirement. Those licensing boards which require an internship for licensure are listed in table 23.

Licensure Requirements for Interns and Residents in Hospitals

Two states and Puerto Rico report that physicians serving internships must be licensed in the state in which the hospital where they are interning is located. Georgia, Indiana, and Puerto Rico have this requirement. New Jersey permits a service of two years and Florida a three year service before licensure, while Minnesota reports that licensure is not required if the internship is being served for the M.D. degree at the University of Minnesota. California, Colorado, Delaware, and Massachusetts require an intern to register with the licensing board, while in West Virginia the requirement applies only to graduates of foreign medical schools.

Twenty-one states and Puerto Rico require that physicians serving as residents in hospitals must be licensed in the state. In Connecticut and Maryland it is not a requirement of the licensing board but is customarily required by hospitals in those states. Fourteen states and the District of Columbia, while not requiring licensure, specify that licensure is recommended, may grant temporary certificates during the period of residency or for a stipulated time, require residents to register with the board, or will permit service for a definite period without licensure.

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[3] Certain state boards of medical licensure, however, require completion of regular college courses in all required subjects.

The regulations of each of the licensing boards that exact some requirement of those engaged in intern or residency training are given in table 24.

Table 21.—*Professional Educational Requirements by Medical Licensing Boards*

	Length of Medical School Academic Year						Total Time Spent in Medical School (Registration to Graduation)						
	Hours	Weeks	Months	Same as Approved Medical Schools	Same as A.A.M.C. and C.M.E. and H.*	Not Specified by Board	Hours	Weeks	Months Annual	Years	M.D. Degree	Same as Approved Medical Schools	Same as A.A.M.C. and C.M.E. and H.*
Alabama	..	..	..	..	..	X	..	..	..	4	..	..	..
Arizona	..	..	..	..	X	..	..	..	..	4	..	..	..
Arkansas	..	..	9	..	..	..	..	..	36	..	..	..	..
California	..	..	..	..	..	X	..	..	..	4	..	..	..
Colorado	..	..	..	..	..	X	..	..	..	..	X	..	..
Connecticut	..	32	..	..	..	..	..	32	..	4	..	..	..
Delaware	..	..	7	..	..	X	..	..	28	..	X	..	..
District of Columbia	..	..	9	..	..	..	..	..	36	..	..	..	..
Florida	..	..	..	..	X	..	..	..	..	..	..	..	X
Georgia	..	..	9	..	..	..	..	..	..	4	..	..	..
Idaho	..	..	9	..	..	..	..	..	..	4	..	..	..
Illinois	..	..	9	..	..	..	..	..	40	..	..	..	..
Indiana	..	..	8	..	..	..	..	..	..	4	..	..	..
Iowa	..	..	9	..	..	..	..	..	..	4	..	..	..
Kansas	..	..	9	..	..	..	..	..	..	4	..	..	..
Kentucky	..	..	9	..	..	..	..	..	..	4	..	..	..
Louisiana	..	..	..	..	X	..	..	..	..	..	X	..	X
Maine	..	..	8	..	..	..	..	..	..	4	..	..	..
	..	..	..	..	X	..	..	..	..	..	..	..	X
	..	32	..	..	..	..	..	..	..	4	..	..	..
	..	..	9	..	..	..	..	..	36	4	..	..	..
	..	30	..	..	..	..	..	..	..	4	..	..	..
	..	32	..	..	..	..	..	..	..	4	..	..	..
	..	32	..	..	..	..	..	..	..	4	..	..	..
	..	..	9	..	..	..	..	..	..	4	..	..	..
	..	..	9	..	..	..	..	..	..	4	..	..	..
Nevada	..	..	9	..	..	..	..	..	..	4	..	..	..
New Hampshire	..	..	..	..	..	X	..	..	..	..	X	..	..
New Jersey	..	..	8	..	..	..	..	..	..	4	..	..	..
New Mexico	..	..	..	X	..	..	..	..	..	..	X	X	..
New York	..	..	8	..	..	..	..	..	..	4	..	..	..
North Carolina	..	..	..	..	..	X	..	..	..	4	..	..	..
North Dakota	..	..	9	..	..	..	..	..	..	4	..	..	..
Ohio	..	..	8½	..	..	..	..	..	..	4	..	..	..
Oklahoma	..	..	..	..	..	X	..	..	..	..	..	X	..
Oregon	..	..	8	..	..	..	..	..	32	4	..	..	..
	..	32	..	..	..	..	1,120	..	..	4	..	..	..
	..	..	..	..	..	X	..	..	..	..	X	..	..
	..	..	..	..	X	..	..	..	..	4	..	..	..
	..	..	..	..	..	X	..	..	..	4	..	..	..
	..	..	9	..	..	..	..	..	36	..	..	..	..
Texas	..	..	8	..	..	..	..	..	..	4	..	..	..
Utah	..	..	9	..	..	..	..	..	..	4	..	..	..
Vermont	900	..	..	..	..	..	..	..	..	4	..	..	..
Virginia	..	..	8	..	..	..	..	..	..	4	..	..	..
	..	..	..	..	X	..	..	..	..	4	..	..	X
	..	..	..	..	..	X	..	..	..	..	X	..	X
	..	..	..	..	X	..	..	..	..	4	..	..	X
Wyoming	..	..	..	..	X	..	..	..	..	..	..	..	X
Alaska	..	..	..	..	X	..	..	..	..	..	..	..	X
Canal Zone	..	..	10	..	..	..	..	..	..	4	X	..	..
Guam	..	..	..	..	..	X	..	..	..	..	..	X	..
Hawaii	..	..	..	..	..	X	..	..	..	..	..	..	X
Puerto Rico	..	..	..	..	X	..	..	..	..	..	..	..	X
Virgin Islands	..	..	..	..	..	X	..	..	..	..	X	..	X

* Association of American Medical Colleges and Council on Medical Education and Hospitals of the American Medical Association.
X Implies requirements are those of the accrediting agencies.

Schedule of Written Examination Dates and Reciprocity Meetings

The schedule of state licensing boards for written examinations for medical licensure and meetings or oral examinations for the issuance of licenses by reciprocity and/or endorsement of credentials is given in table 25. To meet the demands for licensure in recent years as a result of the increase in the number of candidates seeking licensure, examination dates and reciprocity meetings have been scheduled at more frequent intervals. In those states requiring a basic science certificate for licensure, these dates are arranged to coincide closely with the examination and meeting dates of the boards of examiners in the basic sciences. In some states temporary permits are granted enabling physicians to begin the practice of medicine immediately. The next section of this report gives data pertaining to the issuance of temporary permits.

Temporary Permits

The licensing boards of 23 states, Alaska, Puerto Rico, and the Virgin Islands provide for the issuance of temporary permits. These states, the length of validity of the permit, and the number of permits granted during the last calendar year are shown in table 26. Four states were added to this group in 1951. Illinois, which formerly required licensure, will now issue a temporary certificate for postgraduate and specialty training and will also issue a limited license for practice in state hospitals. Nevada prior to 1951 required interns and residents to be licensed but now will issue a temporary permit for one year for work in specific hospitals. South Dakota grants temporary permits for practice in an emergency area for four years. Texas will grant a permit valid until the next board meeting. North Dakota on Jan. 1, 1952, discontinued the granting of permits to displaced foreign physicians for practice in specified areas until citizenship is completed.

There were 676 permits issued by 19 boards. Seven boards did not report the issuance of any permits in 1951.

TABLE 22.—*Medical Schools Requiring an Internship*

United States

College of Medical Evangelists
University of Southern California School of Medicine
Stanford University School of Medicine
Chicago Medical School
University of Minnesota Medical School
Duke University School of Medicine [1]

Canada

University of Manitoba Faculty of Medicine
Dalhousie University Faculty of Medicine
University of Ottawa Faculty of Medicine
University of Montreal Faculty of Medicine

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[1] Degree not withheld until internship completed.

Medical License Fees

Table 27 lists for each state, territory, and possession the fee charged by the medical licensing board for registration by examination and also by reciprocity or endorsement of credentials. The written examination fee tends to be uniform, the majority of the boards charging a fee of $25. The fee for a license by reciprocity or endorsement of credentials varies from $20 to $200, the majority charging a fee of $50. Five states—Florida, Missouri, New York, Texas, and Wisconsin—reported an increase in the fee charged for the written examination, and three states—Missouri, New York, and Wisconsin—an increase in the fee charged for a license without written examination. Three states reported the minimum fee charged for a license without examination but indicate, however, that the charge for such a license would be the same as that exacted by the reciprocating state if more than the minimum specified. Three states have a lower fee for those being certified on the basis of the certificate of the National Board of Medical Examiners than candidates licensed by reciprocity or state licenses.

TABLE 23.—*Medical Licensing Boards Requiring a One Year Internship* *

Alabama
Arizona
California
Colorado
Delaware [1]
District of Columbia
Idaho
Illinois [1]
Iowa [1]
Kentucky
Michigan [1,2]
Nevada
New Hampshire
New Jersey [1,3]
North Dakota
Oklahoma [1]
Oregon
Pennsylvania [1]
Rhode Island [1]
South Dakota
Utah
Vermont
Washington [1]
West Virginia
Wisconsin
Wyoming
Alaska [4]
Guam
Hawaii
Puerto Rico [1]
Virgin Islands

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* Some states require the internship for graduates of medical faculties abroad and from reciprocity or endorsement applicants.

[1] Internship must be a rotating service.

[2] Twenty-four month mixed or straight internship acceptable.

[3] Two year residency in a specialty or one year of postgraduate work accepted.

[4] Active practice for four years accepted in lieu of internship.

Licensure on Government Credentials

In most of the states no provision is made in the medical practice act for the acceptance of government credentials as a basis for licensure without examination. Eleven licensing boards, however, will issue a license to a physician who has passed an examination for admission to the medical corps of the United States Army and Navy, the Public Health Service, or the Veterans Administration. These boards are in Alabama, California, Illinois, Iowa, Pennsylvania, Rhode Island, Texas, Utah, Virginia, Wisconsin, and Puerto Rico.

Annual Registration

Thirty-three states, the District of Columbia, Alaska, and Hawaii require physicians to register their licenses annually or biennially. In table 28 are listed the licensing boards which exact this requirement and the fee charged for such registration. Vermont initiated this requirement in 1951. Some of these boards require such registration whether or not physicians reside in the state. The fee ranges from 1 to $10. Five states have a nonresident fee. Missouri, New York, and West Virginia require biennial registration.

TABLE 24.—*States Exacting Licensure, Registration or Other Requirements of Interns and Residents in Hospitals*

Requirements for Interns

Licensure Required

Florida [2]
Georgia
Indiana
Minnesota [3]
Nevada [4]
New Jersey [5]
Puerto Rico

Required to Register with Licensing Board

California
Colorado [1]
Delaware
Massachusetts
West Virginia [6]

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[1] Not to exceed four years.

[2] May serve for three years without licensure.

[3] Not required if internship is being served for M.D. degree of University of Minnesota.

[4] Temporary certificate for one year specific hospital granted.

[5] May serve for two years without licensure.

[6] Graduates of foreign medical schools required to obtain permission from licensing board.

Requirements for Residents in Hospitals

Licensure Required

Arkansas
California
Connecticut [2]
Georgia
Idaho
Illinois
Indiana
Iowa
Kansas
Kentucky
Louisiana
Maryland [2]
Massachusetts
Michigan
Minnesota
Mississippi
New Mexico
North Dakota
Ohio
Pennsylvania
Texas
Washington
Wisconsin
Puerto Rico

Other Requirements

Colorado [1]
Delaware [3]
Dist. of Columbia [4]
Florida [5]
Illinois [6]
Maine [6]
Nebraska [7]
Nevada [8]
New Jersey [9]
North Carolina [10]
Oklahoma [11]
Rhode Island [12]
South Carolina [13]
Virginia [5]
West Virginia [14]

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[1] Registration with licensing board required annually not to exceed four years.

[2] Customarily required by hospitals.

[3] Registration with licensing board required.

[4] Hospitals must notify licensing board.

[5] May serve for three years without licensure.

[6] Temporary certificate issued.

[7] Licensure recommended.

[8] Temporary certificate for one year in specific hospital.

[9] May serve for two years without licensure.

[10] Limited license granted.

[11] Temporary permit granted for one year; may be renewed for two additional years.

[12] One year of service allowed without licensure.

[13] Must be licensed in some state in six months.

[14] Foreign graduates required to obtain permission from licensing board.

Licensure of Foreign-Trained Physicians

In February, 1950, the Council on Medical Education and Hospitals and the Executive Council of the Association of American Medical Colleges first published a list of foreign medical schools whose graduates they recommend for consideration on the same basis as graduates of approved medical schools in the United States. In the preparation of this initial list, and the two subsequent revisions, these agencies have had the cooperation of an Advisory Committee on Foreign Medical Credentials. Eighteen organizations and governmental agencies, in addition to the two Councils, are represented on the com-

TABLE 25.—*Schedule of Written Examination Dates and Issuance of Licenses by Reciprocity or Endorsement of Credentials*

	Written Examination	Licenses by Reciprocity or Endorsement Issued
Alabama	Annually	Continuously
Arizona	Quarterly	Quarterly
Arkansas	Semi-annually	Continuously
California	Quarterly	Five meetings annually
Colorado	Semi-annually	Quarterly
Connecticut	March, July and Nov.	Continuously
Delaware	Semi-annually	Semi-annually
District of Columbia	Semi-annually	Quarterly
Florida	Semi-annually	No reciprocity
Georgia	June and October	Three times annually
Idaho	Semi-annually	Semi-annually
Illinois	Quarterly	Quarterly
Indiana	Annually, June	Every 6 weeks to 2 months
Iowa	June and December	Every 2 months
Kansas	Semi-annually	Semi-annually
Kentucky	Semi-annually	Bi-monthly
Louisiana	June and December	June and December
Maine	March, July and Nov.	March, July and November
Maryland	Semi-annually	Every 3 to 4 weeks
Massachusetts	January and July	Monthly except August
Michigan	June and October	Continuously
Minnesota	Quarterly	Quarterly
Mississippi	June	June and December
Missouri	Periodically	Periodically
Montana	April and October	April and October
Nebraska	Once annually in June	Quarterly
Nevada	Quarterly	Quarterly
New Hampshire	March and December	March and December
New Jersey	June and October	Monthly except August
New Mexico	Semi-annually	Semi-annually
New York	Jan., June and Oct.	Continuously
North Carolina	June	Five times annually
North Dakota	Semi-annually	Semi-annually
Ohio	June and December	Quarterly
Oklahoma	Annually	Quarterly
Oregon	Semi-annually	Quarterly
Pennsylvania	January and July	Monthly
Rhode Island	Quarterly	Eight meetings annually
South Carolina	Semi-annually	Monthly
South Dakota	Semi-annually	Semi-annually
Tennessee	Quarterly	Continuously
Texas	Twice annually	4 or 5 meetings annually
Utah	Annually, July	3 or 4 meetings annually
Vermont	Twice annually	Continuously
Virginia	Twice annually	Twice annually
Washington	January and July	January and July
West Virginia	Quarterly	Quarterly
Wisconsin	Twice annually	Twice annually
Wyoming	June and October	June and October
Alaska	June and September	Twice annually
Canal Zone	As needed	As needed
Guam	On application	On application
Hawaii	January and July	Continuously
Puerto Rico	Semi-annually	Quarterly
Virgin Islands	Twice annually	Twice annually

TABLE 26.—*Temporary Permits, 1951*

State	Permit Valid for:	Permits Granted
Arizona	Next board meeting	53[1]
Delaware	Four months[5]	6
Florida	Six months	9
Georgia	Next board meeting	0
Idaho	Next board meeting	26
Illinois	Limited license for practice in state hospitals; temporary certificate for postgraduate and specialty training	1
Indiana[2]	Six months	147
Kansas	Next board meeting	0
Kentucky	1-5 years—limited license	0
Louisiana	Until completion of internship	94
Maine	One year	9
Mississippi	Next board meeting	62
Nebraska[2]	Until licensure is perfected	0
Nevada	One year for work in specific hospitals	3
New Hampshire	Varies	0
New Jersey	Two weeks to four months	7
New Mexico	Six months	38
North Carolina	Limited license for residents and for practice in a prescribed territory for a definite period of time	53
Oklahoma	One year for hospital residents[3]	7
South Dakota	For practice in an emergency area for four years	3
Texas	Next board meeting	40
Virginia[2]	Next board meeting	70
West Virginia	Next board meeting	0
Alaska	Next board meeting	14
Puerto Rico	Until 1955	26
Virgin Islands[4]	Six months	0
Totals		676

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1. Includes 6 limited licenses.
2. Reciprocity applicants.
3. May be renewed for two additional years.
4. Government positions only.
5. Permit granted for one year if emergency exists.

mittee. The current list, revised to December, 1951, is contained in table 29. The present list is not final, and it will be supplemented as information is obtained regarding other schools and evaluated by the interested agencies. Since the list is still a preliminary one and other institutions will undoubtedly be added in the future, the position of the Council and the Executive Council with respect to schools not on this list is that they neither approve nor disapprove these schools but must leave to the individual institutions and organizations in the United States the decision whether they will accept graduates of

TABLE 27.—*Medical Licensure Fees*

	Examination	Reciprocity or Endorsement
Alabama	$10	$ 50
Arizona	25	100
Arkansas	25	50[1]
California	25	100
Colorado	25	50
Connecticut	25	50[2]
Delaware	25	100
District of Columbia	25	50
Florida	50	...
Georgia	20	50
Idaho	25	100
Illinois	15	25
Indiana	25	50
Iowa	25	50
Kansas	25	50
Kentucky	25	50
Louisiana	25	50[1]
Maine	25	50
	20	50
	25	50[2]
	25	50
	20	75
	10	50
	25	100[2]
	50	75
	25	50
Nevada	100	200
New Hampshire	20	20
New Jersey	25	100
New Mexico	50	50
New York	30	30
North Carolina	15	50
North Dakota	25	50
Ohio	25	50
Oklahoma	25	100
Oregon	25	100
	25	50
	20	20
	25	50
	20	50
Tennessee	25	50
Texas	40	50
Utah	25	50
Vermont	20	50
Virginia	25	50
	25	25
	25	100
	45	75[1]
	25	50
Alaska	25	100
Guam	50	50
Hawaii	25	25
Puerto Rico	30	30
Virgin Islands	65	50

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1. Minimum.
2. Endorsement of certificate of National Board of Medical Examiners $25.

TABLE 28.—*States Requiring Annual Registration*

	Fee		Fee		Fee
Arizona	$ 5	Kansas	$ 1	Pennsylvania	$ 1
Arkansas	a	Louisiana	2	Tennessee	5
California	2	Minnesota	2	Texas	2
Colorado	b	Missouri *	5	Utah	3
Connecticut	2	Montana	5	Vermont	2
Delaware	10	Nebraska	1	Virginia	1
Dist. of Columbia	2	Nevada	5	Washington	10
Florida	1	New Mexico	d	West Virginia *	2
Georgia	None	New York *	4	Wisconsin	3
Idaho	10	North Dakota	e	Wyoming	2.50
Indiana	c	Oklahoma	3	Alaska	10
Iowa	1	Oregon	10	Hawaii	2

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a. Residents $2, Nonresidents $4.
b. Residents $2, Nonresidents $10.
c. Residents $5, Nonresidents $10.
d. Residents $2, Nonresidents $5.
e. Residents $5, Nonresidents $2.
* Biennial registration.

these schools on the same basis as they accept graduates of approved medical schools in the United States. Forty-nine schools in 13 countries comprise the present listing.

Twenty-three licensing boards have reported the acceptance of this list in the consideration of applicants for licensure. Twelve boards stipulate that recognition is limited to graduates of schools on the list; two boards specify that graduates of foreign medical faculties after Jan. 1, 1940, are not eligible for licensure unless they have graduated from a school on the published list or have done some special work in an approved medical school in the United States or in a recognized hospital; and one board will accept other graduates if they possess either a certificate of the National Board of Medical Examiners or one of the American boards in the specialties. The remaining eight boards have reported they accept the list but do not specify whether they also accept graduates of other schools. Foreign-trained physicians are not eligible for licensure in 11 states.

The present requirements for candidates seeking medical licensure in the United States and its territories and outlying possessions on the basis of credentials obtained in countries other than the United States and Canada are given in table 30. Forty-three boards will admit foreign physicians to the licensing examination under varying conditions. Arizona, Maine, North Carolina, and West Virginia, which heretofore did not license foreign-trained physicians, have indicated that they will now accept applications for licensure. In other states, the regulations have been modified to enable qualified physicians to obtain the right to practice medicine. Nine boards do not require citizenship, while 22 boards require full citizenship. Twelve boards require that the applicant file first citizenship papers only. North Dakota, which requires

TABLE 29.—*Foreign Medical Schools*

List Prepared by the Council on Medical Education and Hospitals of the American Medical Association and the Executive Council of the Association of American Medical Colleges

On the basis of information presently available, the Council on Medical Education and Hospitals of the American Medical Association and the Executive Council of the Association of American Medical Colleges are of the opinion that medical institutions and medical organizations in the United States would be justified in considering current and past graduates of the following foreign medical schools on the same basis that they consider graduates of approved medical schools in the United States. This list is not final and will be supplemented as information is compiled for other schools.

Belgium

Free University of Brussels Faculty of Medicine
(Université Libre de Bruxelles Faculté de Médecine)
Catholic University of Louvain Faculty of Medicine
(Université Catholique de Louvain Faculté de Médecine or Katholieke Universiteit te Leuven)
University of Ghent Faculty of Medicine
(Universiteit te Gent Faculteit der Geneeskunde, or Université de Gand Faculté de Médecine)
University of Liège Faculty of Medicine
(Université de Liège Faculté de Médecine)

Brazil

University of São Paulo Faculty of Medicine
(Universidade de São Paulo Faculdade de Medicina)

Denmark

University of Copenhagen Faculty of Medicine
(Kobenhavns Universitet Laegevidenskabelige Fakultet)

Finland

University of Helsinki Faculty of Medicine
(Helsingfors Universitet Medicinska Fakulteten)
Medical Faculty Turku University
(Turun Yliopiston Laaketieteellinen Tiedekunta)

Lebanon

American University of Beirut School of Medicine

Netherlands

University of Amsterdam Faculty of Medicine
(Universiteit van Amsterdam Geneeskunde Faculteit)
State University of Groningen Faculty of Medicine
(Rijks-Universiteit te Groningen Medische Faculteit)
State University of Leiden Faculty of Medicine
(Rijks-Universiteit te Leiden Faculteit der Geneeskunde)
State University of Utrecht Faculty of Medicine
(Rijks-Universiteit te Utrecht Faculteit der Geneeskunde)

Norway

University of Oslo Faulty of Medicine
(Kongelige Frederiks Universitet Medisinske Fakultet)

Sweden

Royal Charles University Medical Faculty, Lund
(Kungl. Karolinska Universitetet Medicinska Fakulteten)
Charles Medico-Surgical Institute, Stockholm
(Karolinska Mediko-Kirurgiska Institutet)
Royal University of Uppsala Medical Faculty
(Kungl. Universitetet i Uppsala Medicinska Fakulteten)

Switzerland

The recommendation with respect to the following medical schools in Switzerland applies only to those graduates of Swiss medical schools who hold the Swiss Federal Diploma issued by the Federal Department of the Interior (Eidgendoissisches Department Des Innern, Département Fédéral de L'Intérieur) and obtainable only by Swiss citizens who hold the Certificate of Medical Studies (Akademische Zeugnis, Certificat d'Études Médicales), or who hold one of the following certificates which the Swiss Universities issue to those, not citizens of Switzerland, who complete a course of study and pass examinations equivalent to those taken by Swiss citizens in qualifying for the Swiss Federal Diploma:

University of Basel—Academic Certificate on passing the medical examination for physicians (Akademische Zeugnis uber die bestandene Fachprufung für Ärzte).

University of Bern—Medical diploma on passing examination for medicine (Aerztliches Fakultats diplom uber die bestandene Fachprufung für Ärzte).

University of Geneva and University of Lausanne—Certificate of Medical Studies (*Certificat d'Ètudes Médicales*).

University of Zurich—Medical diploma for Foreigners (Medizinisches Diplom für Ausländer).

University of Basel Faculty of Medicine
(Universität Basel Medizinische Fakultät)
University of Bern Faculty of Medicine
(Universität Bern Medizinische Fakultät)
University of Geneve Faculty of Medicine
(Université de Genève Faculté de Médecine)
University of Lausanne Faculty of Medicine
(Université de Lausanne Faculté de Médecine)
University of Zurich Faculty of Medicine
(Universität Zurich Medizinische Fakultät)

United Kingdom

The recommendation applies only to those physicians trained in the United Kingdom who hold medical degrees from the universities listed. The recommendation does not apply to those physicians who received their medical training at these universities or their affiliated hospital medical schools but who did not complete the work for the degree and who obtained their qualifications only through the examinations of the licensing corporations of the United Kingdom.

England

University of Birmingham Faculty of Medicine
University of Bristol Faculty of Medicine
University of Cambridge Faculty of Medicine
University of Durham Medical School, Newcastle-upon-Tyne
University of Leeds Faculty of Medicine
University of Liverpool Faculty of Medicine
University of London †
University of Manchester Faculty of Medicine
University of Oxford Faculty of Medicine
University of Sheffield Faculty of Medicine

Northern Ireland

Queen's University of Belfast Faculty of Medicine

Scotland

University of Aberdeen Faculty of Medicine
University of Edinburgh Faculty of Medicine
University of Glasgow Faculty of Medicine
University of St. Andrews Medical School, St. Andrews and Dundee

Wales

Welsh National School of Medicine, University of Wales, Cardiff

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† Work for the medical degree of the University of London is offered at the following hospital medical schools:

Charing Cross Hospital Medical School
Guy's Hospital Medical School
King's College Hospital Medical School
London Hospital Medical School
Middlesex Hospital Medical School
Royal Free Hospital School of Medicine
St. Bartholomew's Hospital Medical College
St. George's Hospital Medical School
St. Mary's Hospital Medical School
St. Thomas' Hospital Medical School
University College Hospital Medical School
Westminster Hospital Medical School

TABLE 30.—Requirements of Candidates for Medical Licensure on the Basis of Credentials Obtained in Countries Other Than the United States and Canada

	Admitted to Examination	Admitted by Endorsement of State License*	Citizenship	Basic Science Certificate	Internship or Residency in Hospital in United States	Further Medical Training	Examination Fee, Dollars	Footnotes
Alabama	x	..	x	..	x	..	10	1
Arizona	x	..	1stP	x	x	..	25	30
Arkansas	Not accepted[35]							
California	x	x	x	..	x	..	25	2
Colorado	x	..	x	x	x	x	25	7, 12, 25
Connecticut	x	x	1stP	x	..	..	25	28
Delaware	x	..	x	..	x	x	25	4, 7
District of Columbia	x	x	..	x	x	..	25	5, 24
Florida	x	..	x	x	..	..	50	3, 28
Georgia	x	x	x	..	..	..	20	24
Idaho	Not accepted							
Illinois	x	..	1stP	..	x[38]	..	15	39
Indiana	x	..	..	..	..	x	25	7
Iowa	x	..	x	x	x	x	25	8, 26
Kansas	x	..	x	..	x	..	25	9
Kentucky	Not accepted							
Louisiana	Not accepted							
Maine	x	x	..	..	..	..	25	28
Maryland	x	..	1stP	..	x	x	20	6, 26
Massachusetts	x	..	1stP	..	..	..	25	29
Michigan	x	..	..	x	x	x	25	7, 36
Minnesota	x	..	1stP	x	x	..	20	12
Mississippi	x	..	x	..	..	..	10	24
Missouri	x	..	x	..	x	..	25	12
Montana	Not accepted							
Nebraska	x	..	x	x	..	..	25	22, 28
Nevada	Not accepted							
New Hampshire	x	x	x	..	x	..	30	14, 28, 34
New Jersey	x	x	x	..	x	..	25	13, 15
New Mexico	x	..	1stP	x	..	..	50	27
New York	x	x	1stP	..	..	..	30	16, 28
North Carolina	x	..	..	..	..	..	15	24, 32
North Dakota	x	..	x	..	x	x	25	11, 17, 31
Ohio	x	x	x	..	..	..	25	28, 33
Oklahoma	Not accepted							
Oregon	x	..	x	x	x	..	25	24
Pennsylvania	x	..	1stP	..	x	..	25	19, 28
Rhode Island	x	..	1stP	x	x	x	20	10, 20
South Carolina	Not accepted							
South Dakota	x	..	..	x	x	..	20	18, 24
Tennessee	x	..	x	x	..	..	25	24
Texas	x	..	..	x	..	..	25	21
Utah	Not accepted							
Vermont	Not accepted[14]							
Virginia	x	..	1stP[23]	..	..	..	25	20
Washington	x	..	..	x	x	..	25	24
West Virginia	x	..	x	..	x	..	25	28, 40
Wisconsin	x	..	1stP	x	x	..	25	24
Wyoming	Not accepted							
Alaska	x	x	x	x	x	..	25	24
Guam	x	x	x	..	x	..	50	24
Hawaii	x	..	x	..	x	..	25	14, 24
Puerto Rico	x	x	x	..	x	x	30	37
Virgin Islands	x	..	..	..	x	..	65	24

This summary should be supplemented by direct communication with the secretary of the licensing board of the state in which the physician is interested.

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x. Implies Yes.

* Refer to chart "Reciprocity and Endorsement Policies" for further data.

1. Candidate is eligible if his credentials have been appraised by the National Board of Medical Examiners and approved.

2. (a) Citizenship waived if country in which applicant is licensed will admit to licensure citizens of the United States. (b) Acceptable for reciprocal registration if license submitted was granted on same standards as in effect in California on the same date and upon completion of an oral, clinical and written examination. (c) Internship in United States satisfactory to the board.

3. Graduates of foreign medical schools not on approved list are considered individually and may be accepted if they have had postgraduate training in the United States to qualify for certification by one of the American specialty boards, or at least a three year residency in an approved hospital.

4. Residence of one year in Delaware required.

5. (a) Acceptable for reciprocal registration if similar privileges are accorded licentiates of District of Columbia by licensing agency or jurisdiction from which the applicant comes. (b) Regulations cited refer also to graduates of Canadian schools.

6. Graduates of South or Central America required to obtain medical degree from approved medical school in the United States.

7. Further training—Completion of senior year in approved medical school in the United States.

8. Further training—Internship or one year in medical school in the United States.

9. (a) Applicant must be licensed to practice medicine and surgery in country in which school of graduation is located, otherwise required to complete senior year in approved medical school in United States. (b) In lieu of internship, certificate from three graduates of the applicant's medical school licensed to practice medicine in United States accepted.

10. Must serve one year internship in approved hospital in U. S. and pursue postgraduate study or serve additional one year internship or residency.

11. Citizenship requirements waived for displaced physicians.

12. Credentials must be submitted in original form and accompanied by translation, and will be directly verified or documents should bear evidence of being visaed by the U. S. Consul in the country wherein the school of graduation is or was located.

13. Must submit original certificate covering medical courses, original diploma and license to practice in the foreign country with translations made by the Lawyers' and Merchants' Translation Bureau, New York City.

14. Diplomates of National Board of Medical Examiners eligible on reciprocity basis.

15. (a) Internship completed in foreign countries after July 1, 1934 not acceptable. (b) Graduates of medical schools of Europe and Asia prior to Nov. 19, 1941 accepted. (c) Graduates of medical schools of South American Republics, Mexico, Cuba and Switzerland not accepted.

16. Graduates of continental European medical schools after Jan. 1, 1910 not acceptable. Graduates of medical schools in Mexico and Latin and South America required to complete two years of approved internship or one year of postgraduate medical study.

17. License to practice medicine and surgery in country in which school of graduation is located, otherwise required to complete senior year in approved medical school in United States.

18. Applicant required to practice in an emergency area for four years under a temporary license and reappear before the board for permanent licensure.

19. Medical education completed in foreign medical schools since 1941 not acceptable.

20. (a) Matriculants in foreign medical faculties subsequent to Jan. 1, 1949 not acceptable. (b) Applicant must be licensed to practice medicine and surgery in country in which school of graduation is located.

21. European graduates after 1939 limited to English speaking schools.

22. Internship of one year in an approved hospital in the United States after acquiring full citizenship required. If application is accepted, the board has established basic recommendations which must be met prior to citizenship.

23. This requirement may be waived.

24. Recognition limited to graduates of schools accepted by Council on Medical Education and Hospitals of the American Medical Association and Executive Council of Association of American Medical Colleges.

25. Graduates of foreign medical schools after Jan. 1, 1940 not accepted.

26. Graduates of foreign medical schools are [illegible] Graduates of medical schools in Europe who obta[illegible] after Jan. 1, 1910 are not eligible unless they have [illegible] the schools listed by the Council on Medical Education and Hospitals of the American Medical Association and the Executive Council of the Association of American Medical Colleges, or have done some special work in an approved medical school in the United States or a recognized hospital.

27. Graduates of foreign medical schools not included on list issued by the Council on Medical Education and Hospitals of the American Medical Association and the Executive Council of the Association of American Medical Colleges may be accepted if they possess either a certificate of the National Board of Medical Examiners or the certificate of one of the American boards in the specialties.

28. List of foreign medical schools prepared by the Council on Medical Education and Hospitals of the American Medical Association and Executive Council of the Association of American Medical Colleges accepted.

29. Graduates of foreign medical schools who matriculated in medical school prior to Jan. 1, 1941 are eligible to apply for admission to the examinations. Graduates after Jan. 1, 1941 must be graduates of a medical school approved [illegible] for Colleges and Medical Schools of the [illegible]. The Approving Authority has not appr[illegible].

30. Permissible by law at the discretion of the board. A graduate of a foreign medical school who has served in the Armed Forces of the United States and has an honorable discharge is eligible for licensure.

31. Graduates of continental European medical schools after 1939 not accepted.

32. Considered on an individual basis.

33. Graduates of medical schools of continental Europe prior to 1944 not accepted. Required to hold license to practice in foreign country.

34. Temporary license valid until citizenship is completed may be given.

35. Eligible for licensure by Homeopathic State Medical Board. Citizenship, one year internship and basic science certificate required.

36. Further training.—Completion of senior year in approved medical school in the United States or Canada; or M.S. or D.S. degree in basic science or clinical medicine from graduate school affiliated with approved medical school; or in lieu of above, certificate of a comprehensive examination in basic sciences and clinical medicine by a joint screening board of examiners from the faculties of medical schools of University of Michigan and Wayne University.

37. Further training—required at the discretion of the board.

38. Approved rotating internship in Illinois required.

39. Limited license issued for practice in hospitals maintained by the state.

40. Applicant shall have resided in West Virginia for at least three years immediately preceding application and must be recommended by local medical society.

TABLE 31.—FOREIGN TRAINED PHYSICIANS EXAMINED

Marginal Number	SCHOOL	Arizona		California		Colorado		Connecticut		Delaware		Dist. of Columbia		Florida		Georgia		Illinois		Indiana		Iowa		Maine	
		P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F
	ARGENTINA																								
1	Universidad Nacional, Rosario	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..
	AUSTRIA																								
2	Karl-Franzens-Universität, Graz	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	1	..	..	..	..	..	..
3	Universität Wien	..	..	1	3	1	0	0	3	..	..	..	..	..	..	1	0	8	2	..	..	..	..	0	1
4	Universität Innsbruck	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	1	..	..	..	..	..	..
	BELGIUM																								
5	Université de Bruxelles	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
6	Université de Ghent	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
7	Université de Liège	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	BULGARIA																								
8	University of Sofia	..	..	2	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	CHINA																								
9	Aurora University, Shanghai	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
10	Cheeloo University, Shantung	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..
11	Hackett Medical College for Women, Canton	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
12	Hsiang Ya Medical College, Changsha	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..
13	Military Medical College (National Defense Center, Formosa) Nanking	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
14	National College of Medicine of Shanghai	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
15	National Sun Yat-sen University, Canton	..	..	2	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
16	Peiping Union Medical College	..	..	1	0	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..
17	Pennsylvania Medical School, Shanghai	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
18	St. John's University,	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
19	Women's Christian Me	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	COLOMBIA																								
20	Universidad de Antioguia, Medellin	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
21	Universidad de Cartagena	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	CUBA																								
22	Universidad de la Habana	..	..	2	1	..	..	1	1	..	..	..	..	3	0	..	..	11	11	..	..	..	..	..	..
	CZECHOSLOVAKIA																								
23	Universita Komenského, Bratislava	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
24	Masarykova Universita, Brno	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
25	Deutsche Universität, Prague	..	..	1	2	..	..	..	..	..	..	..	..	..	..	..	..	4	1	..	..	..	..	0	1
26	Universität Karlova, Praha	..	..	..	..	..	..	1	0	..	..	..	..	1	0	..	..	2	3	..	..	..	..	..	..
	DENMARK																								
27	Kobenhavns Universitet	..	..	1	0	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	DOMINICAN REPUBLIC																								
28	Universidad de Santo Domingo	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	ECUADOR																								
29	Universidad Central, Quito	..	..	..	..	..	..	..	..	..	..	1	0	..	..	1	0	2	0	..	..	..	..	..	..
30	Universidad Guayaquil	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..
	EL SALVADOR																								
31	Universidad de El Salvador	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	2	0	..	..	..	..	..	..
	ENGLAND																								
32	University of Bristol	..	..	1	0	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..
33	University of Cambridge	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
34	University of Durham (Kings College)	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
35	University of Leeds	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
36	University of London	..	..	2	0	..	..	..	..	..	..	1	0	0	2	..	..	..	..	..	..	..	..	..	..
37	University of Manchester	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
38	Licentiate, Royal College of Physicians of London and Member, Royal College of Surgeons of England	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
39	Licentiate, Apothecaries' Society of London	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	ESTONIA																								
40	*Tartu Ulikooli*	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	1	2	..	..	..	..	..	..
	FINLAND																								
41	Helsingfors Universitet	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..
	FRANCE																								
42	Université de Montpellier	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
43	Université de Nancy	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
44	Université de Paris	..	..	0	1	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
45	Université de Strasbourg	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..
	GERMANY																								
46	Friedrich-Wilhelms-Universität, Berlin	..	..	..	..	1	1	1	0	..	..	..	..	..	..	..	..	0	3	..	..	..	..	..	..
47	Rhenische Friedrich-Wilhelms-Universität, Bonn	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	2	..	..	..	..	..	..
48	Schlesische-Friedrich-Wilhelms-Universität, Breslau	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..
49	Medizinische Akademie Düsseldorf	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	0	..	..	..	..	..	..
50	Johann Wolfgang Goethe-Universität, Frankfurt-am-Main	..	..	1	0	..	..	0	1	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..
51	Friedrich-Alexanders-Universität, Erlangen	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..
52	Albert-Ludwigs-Universität, Freiburg	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
53	Göttingen	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	2	..	..	..	..	..	..
54		..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..
55		..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	2	0	..	..	..	..	..	..
56	Thuringische Landesuniversität, Jena	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
57	Universität-Köln	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	0	2	..	..	..	..	..	..
58	Albertus-Universität, Königsberg	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
59	Universität-Leipzig	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
60	Philipps-Universität, Marburg	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..
61	Ludwig Maximillians-Universität, München	..	..	2	2	..	..	..	..	..	..	..	..	..	..	..	..	4	2	..	..	..	..	..	..
62	Universität, Münster	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
63		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
64	bingen	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	4	..	..	..	..	..	..
65	Wurzburg	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..
	GREECE																								
66	National University of Athens	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	4	..	..	..	..	..	..
	HAITI																								
67	École Nationale de Médecine, Port-au-Prince	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..
	HUNGARY																								
68	Magyar Királyi Pázmány Petrus Tudományegyetem, Budapest	..	..	1	1	..	..	1	0	..	..	1	0	1	0	..	..	2	1	..	..	..	..	..	..
69	Magyar Királyi Tisza-István Tudományegyetem, Debrecen	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
70	Magyar Királyi Erzébet Tudományegyetem, Pecs	..	..	0	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
71	Magyar Királyi Ferencz Jozsef Tudományegyetem, Szeged	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..
	INDIA																								
72	Woman's Christian Medical College, Punjab	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..
	IRAN																								
73	Madresseh Teb, Teheran	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	IRAQ																								
74	Royal Iraq Medical College, Bagdad	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

Maryland		Massachusetts		Michigan		Minnesota		Mississippi		Missouri		Nebraska		New Hampshire		New Jersey		New York		North Carolina		North Dakota		Ohio		Oklahoma		Pennsylvania		Rhode Island		South Dakota		Texas		Virginia		Washington		West Virginia		Wisconsin		Alaska		Totals	Examined—Passed	Examined—Failed	Percentage Failed	Number of Boards Examined by	Marginal Number
P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F						
																																														1	1	0	0.0	1	1
																		2	7					2	2			1	0																	18	8	10	55.6	4	2
1	1	0	2							1	0							19	25			0	1	1	1	1	0	1	0					1	0					2	0					77	38	39	50.6	16	3
																																														4	3	1	25.0	1	4
																		0	1																											2	1	1	50.0	2	5
																		1	1																											2	1	1	50.0	1	6
																		0	1																											1	0	1	100.0	1	7
																		1	1					0	1																					5	3	2	40.0	3	8
																																														1	1	0	0.0	1	9
																																														1	1	0	0.0	1	10
																																														1	0	1	100.0	1	11
																														1	0															2	2	0	0.0	2	12
																																0	1													1	0	1	100.0	1	13
																																														1	1	0	0.0	1	14
																																														2	2	0	0.0	1	15
																		1	0																											3	3	0	0.0	3	16
																																														1	1	0	0.0	1	17
																1	0																											1	0	3	3	0	0.0	3	18
																																														1	1	0	0.0	1	19
																		1	0																											1	1	0	0.0	1	20
																																														1	1	0	0.0	1	21
										1	0							1	0											1	0			0	1									0	1	35	20	15	42.9	9	22
										1	0							1	1																											3	2	1	33.3	2	23
																		0	1					1	0																					2	1	1	50.0	2	24
0	1	0	1															11	10																											32	16	16	50.0	6	25
1	3																	10	9																											30	15	15	50.0	5	26
																		0	1																											3	2	1	33.3	3	27
																		0	2																									1	0	3	1	2	66.7	2	28
																																														4	4	0	0.0	3	29
																																														2	1	1	50.0	1	30
																																														3	2	1	33.3	2	31
																																														2	2	0	0.0	2	32
						1	0																	1	0																					2	2	0	0.0	2	33
																																				2	0									3	2	1	33.3	2	34
																																				1	0									1	1	0	0.0	1	35
						1	0													1	0													1	0	1	0									9	7	2	22.2	7	36
																								1	0																					1	1	0	0.0	1	37
																		2	0																	1	0									3	3	0	0.0	2	38
																		1	1																											2	1	1	50.0	1	39
		0	1															3	3			2	0	1	0																			1	0	15	8	7	46.7	7	40
		0	1																									1	0													1	0			4	3	1	25.0	4	41
																		1	0																											1	1	0	0.0	1	42
																		2	2																											4	2	2	50.0	1	43
																1	0	3	2																											8	5	3	37.5	4	44
																		2	1																											4	3	1	25.0	2	45
0	2	0	1					1	0									12	15					3	0																					40	18	22	55.0	8	46
																																														3	1	2	66.7	1	47
1	0	1	0															5	5																											13	7	6	46.2	4	48
																																														2	2	0	0.0	1	49
1	0	1	0													2	1	0	2																											11	6	5	45.5	7	50
												1	0					1	0																											4	3	1	25.0	3	51
						1	0											0	1					1	0																					3	2	1	33.3	3	52
																																				1	0									5	3	2	40.0	2	53
																		0	3															1	0											6	2	4	66.7	4	54
																		2	3																											8	5	3	37.5	3	55
																		1	1																											2	1	1	50.0	1	56
																		0	1																											4	0	4	100.0	3	57
																		1	0																											1	1	0	0.0	1	58
																		1	2					1	1																					5	2	3	60.0	2	59
																						1	0	1	0																					4	3	1	25.0	3	60
		1	1							1	0							1	5					1	0															1	0					21	11	10	47.6	7	61
																																														1	0	1	100.0	1	62
																		0	2																											2	0	2	100.0	1	63
																																														13	9	4	30.8	1	64
																		0	1																											2	0	2	100.0	2	65
		0	2	1	0									0	1	1	0	1	3					1	1																					17	6	11	64.7	7	66
		0	1																																											2	0	2	100.0	2	67
1	2	1	2															5	11			0	1	4	3							1	1											1	0	41	19	22	53.7	12	68
																		1	2					1	1																					7	3	4	57.1	3	69
																		2	1					0	1																					7	2	5	71.4	3	70
																		0	2					1	1																					7	3	4	57.1	4	71
																																														1	1	0	0.0	1	72
																		0	1																											1	0	1	100.0	1	73
																		0	1																											1	0	1	100.0	1	74

TABLE 31.—FOREIGN TRAINED PHYSICIANS EXAMINED

Marginal Number	SCHOOL	Arizona		California		Colorado		Connecticut		Delaware		Dist. of Columbia		Florida		Georgia		Illinois		Indiana		Iowa		Maine	
		P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F
	IRELAND																								
75	National University of Ireland	..	..	3	0	..	..	1	0	..	..	..	..	..	..	..	..	3	0	..	..	..	..	..	..
76	University of Dublin	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
77	Queen's University,	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
78	Licentiate of Apoth	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	ITALY																								
79	Regia Università di Bari	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
80	Regia Università di Bologna	..	..	4	1	..	..	0	1	..	..	..	..	..	..	..	..	1	0	..	..	..	..	0	1
81	Regia Università di Catania	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
82	Regia Università di	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..
83	Regia Università di	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..
84	Regia Università di Messina	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
85	Regia Università di	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
86	Regia Università di	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..
87	Regia Università di	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
88	Regia Università di Parma	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..
89	Regia Università di Pavia	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
90	Regia Università di Palermo	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..
91	Regia Università di Pisa	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..
92	Regia Università di Roma	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1
93	Regia Università di Siena	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
94	Regia Università di Turin	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	JAPAN																								
95	Keio Gijiku University, T	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
96	Tokyo Charity Associatio	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	LATVIA																								
97	University of Riga	..	..	5	1	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..
	LEBANON																								
98	American University of Beirut	..	..	1	1	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..
	LITHUANIA																								
99	Vytauto Didziojo Universiteto, Kaunas	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	14	..	..	..	..	..	..
	MEXICO																								
100	Universidad de	..	..	1	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
101	Escuela Libre d	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
102	Escuela Médico Militar, Mexico City	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..
103	Universidad Nacional, Mexico City	..	..	3	5	..	..	..	..	..	..	..	..	1	0	..	..	3	3	..	..	..	..	..	..
104	Escuela de Medicina de Nuevo Leon, Monterrey	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..
	NETHERLANDS																								
105	Rijks-Universiteit te Groningen	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
106	Rijks-Universiteit te Leiden	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
107	Rijks-Universiteit te Utrecht	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	NEW ZEALAND																								
108	University of New Zealand, Dunedin	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	NICARAGUA																								
109	Universidad de Nicaragua, Leon y en Granada	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	NORWAY																								
110	Universitet Oslo	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	PARAGUAY																								
111	National University of Paraguay, Asuncion	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	PERU																								
112	Universidad Mayor de San Marcos, Lima	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	PHILIPPINES																								
113	University of Santo Tomas, Manila	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	0	1	0	1	..	..	..	..
114	University of the Philippines, Manila	..	..	3	0	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..
	POLAND																								
115	Uniwersytet Jagiellónski, Cracow	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..
116	Uniwersytet Jana Kazimieraz, Lwow	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..
117	Uniwersytet Lemberg	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
118	Uniwersytet Poznánski, Poznan	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..
119	Uniwersytet Jozefa Pilsudskiégo, Warszawa	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..
120	Uniwersytet Stefana Batorego, Wilno	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..
	PORTUGAL																								
121	University of Coimbra	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	RUMANIA																								
122	Universitatea din Bucuresti	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	0	1	..	..	..	..	..	..
123	Universitatea din Cluj	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
124	Universitatea din Iasi	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	SCOTLAND																								
125	University of Glasgow	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
126	Licentiate Royal College of Physicians and Surgeons of Edinburgh and Glasgow	..	..	..	..	..	..	..	..	..	..	..	..	1	0	1	0	..	..	..	..	..	..	..	..
127	Polish School of Medicine, Edinburgh	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
128	St. Mungo's College Medical School, Glasgow	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
129	University of St. Andrews, St. Andrews and Dundee	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	SOUTH AFRICA																								
130	University of Witwatersrand, Johannesburg	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	SPAIN																								
131	Central University, Madrid	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
132	University of Seville	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	SWITZERLAND																								
133	Universität Basel	..	..	..	..	1	0	1	1	..	..	..	..	..	..	..	..	0	2	..	..	..	..	..	..
134	Universität Bern	..	..	1	1	..	..	2	0	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..
135	Université de Genève	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
136	Université de Lausanne	..	..	2	0	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
137	Universität Zurich	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	TURKEY																								
138	University of Istanbul	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	UNION OF SOCIALIST SOVIET REPUBLICS																								
139	Dnepropetrovsk Medical Institute	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
140	First Moscow Medical Institute	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
141	Kazan Medical Institute	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
142	Odessa Medical Institute	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
143	State University of Baku	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
144	Kharkov Medical Institute	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..
	YUGOSLAVIA																								
145	Beogradskog Universiteta	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
146	Zagrebaskog Universiteta	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..
	Totals	1		96		4		21		1		8		10		4		174		1		1		4	
	Totals—Examined—Passed	1		56		3		13		1		6		8		4		92		0		1		0	
	Totals—Examined—Failed	0		40		1		8		0		2		2		0		82		1		0		4	
	Percentage Failed	0.0		41.7		25.0		38.1		0.0		25.0		20.0		0.0		47.1		100.0		0.0		100.0	

Maryland		Massachusetts		Michigan		Minnesota		Mississippi		Missouri		Nebraska		New Hampshire		New Jersey		New York		North Carolina		North Dakota		Ohio		Oklahoma		Pennsylvania		Rhode Island		South Dakota		Texas		Virginia		Washington		West Virginia		Wisconsin		Alaska		Totals	Examined—Passed	Examined—Failed	Percentage Failed	Number of Boards Examined by	Marginal Number
P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F						
4	0	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	15	14	1	6.7	6	75
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	0	0.0	1	76
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	1	1	0	0.0	1	77
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	0	0.0	1	78
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	0	3	100.0	1	79
..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	0	2	5	15	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	31	11	20	64.5	7	80
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4	3	1	25.0	2	81
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	0	0.0	1	82
0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5	2	3	60.0	3	83
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	0	0.0	1	84
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	3	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5	2	3	60.0	2	85
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	2	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	3	6	66.7	4	86
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	1	1	50.0	1	87
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	1	100.0	1	88
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	1	100.0	1	89
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	3	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5	1	4	80.0	3	90
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	3	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	6	2	4	66.7	3	91
1	0	1	3	..	..	..	..	..	..	..	..	..	..	..	..	0	1	2	5	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	17	6	11	64.7	7	92
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	1	100.0	1	93
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	1	2	66.7	1	94
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	1	100.0	1	95
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	1	100.0	1	96
..	..	..	..	..	..	2	0	..	..	..	..	..	..	..	..	..	..	8	13	..	..	1	1	4	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	36	21	15	41.7	6	97
1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4	1	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	11	9	2	18.2	6	98
2	2	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	8	15	..	..	..	..	11	12	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	74	31	43	58.1	5	99
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	1	2	66.7	2	100
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	0	0.0	1	101
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	0	0.0	1	102
..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	20	9	11	45.0	6	103
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	1	1	50.0	2	104
..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	3	1	2	66.7	2	105
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	1	1	50.0	2	106
1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	1	1	50.0	1	107
..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	0	0.0	1	108
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	1	1	50.0	1	109
1	0	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	4	4	0	0.0	4	110
..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	0	0.0	1	111
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	1	100.0	1	112
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	0	3	100.0	3	113
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5	4	1	20.0	3	114
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	7	3	..	..	2	0	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	14	10	4	28.6	4	115
2	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	7	9	..	..	1	1	2	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	27	13	14	51.9	5	116
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	1	0	1	100.0	1	117
0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5	2	3	60.0	4	118
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	6	5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	12	7	5	41.7	2	119
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	6	2	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	12	8	4	33.3	3	120
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	1	100.0	1	121
1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5	3	2	40.0	4	122
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	1	1	50.0	1	123
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	1	100.0	1	124
..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	1	0	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	0	..	..	..	..	..	..	..	..	5	4	1	20.0	4	125
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	8	6	2	25.0	3	126
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	0	0.0	1	127
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	1	100.0	1	128
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	1	1	0	0.0	1	129
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	3	0	0.0	1	130
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	0	0.0	1	131
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	1	100.0	1	132
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	6	4	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	17	9	8	47.1	6	133
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	9	5	4	44.4	5	134
..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	1	0	5	6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	14	8	6	42.8	4	135
..	..	0	2	..	..	..	..	..	..	1	0	..	..	..	..	0	1	0	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	11	4	7	63.6	6	136
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4	3	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	8	5	3	37.5	2	137
..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	2	0	0.0	2	138
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	0	0.0	1	139
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	3	..	..	..	..	1	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	6	1	5	83.3	2	140
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	1	100.0	1	141
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	1	1	50.0	1	142
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	1	100.0	1	143
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	1	100.0	1	144
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	2	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4	1	3	75.0	2	145
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	2	1	1	50.0	2	146
32		25		5		7		1		8		1		1		14		448		1		12		80		1		3		7		6		6		10		1		4		2		6		1,006	...	...	....	...	
18		6		4		7		1		8		1		0		7		192		1		8		46		1		3		7		3		4		10		1		4		2		5		...	524	...	....	...	
14		19		1		0		0		0		0		1		7		256		0		4		34		0		0		0		3		2		0		0		0		0		1		...	...	482	....	...	
43.7		76.0		20.0		0.0		0.0		0.0		0.0		100.0		50.0		57.1		0.0		33.3		42.5		0.0		0.0		0.0		50.0		33.3		0.0		0.0		0.0		0.0		16.7		...	...	...	47.9	...	

full citizenship, will waive this requirement for displaced physicians, and Virginia reported it may waive the requirement of first papers. Twenty-eight states indicate the foreign-trained physician must serve an internship or obtain further medical training in the United States. This chart has been developed in an effort to be of assistance to the foreign-trained physician seeking licensure in the United States. In connection with the state requirements of any one state, specific attention is called to the footnotes referred to in the last column which supplement the tabular data.

In the preparation of this table it was apparent that the licensure of foreign-trained physicians has been given serious consideration by the authorities in the various states, and in many states methods have been devised to provide for licensure without lowering the standards of medical practice in the United States. While an attempt has been made to present the situation as it exists, it should be borne in mind that this table is intended to present a summary of existing requirements, and physicians are urged to supplement the information contained in this table by direct communication with the licensing boards. It should further be understood that each application is considered individually by the licensing boards, so that this summary does not absolutely guarantee licensure in those states that have indicated foreign-trained physicians are eligible for licensure.

The states of Illinois, Iowa, South Dakota, and West Virginia have announced that they are attempting to aid displaced physicians to establish themselves in practice in those states. Illinois, Kentucky and South Dakota will issue temporary permits to foreign-trained physicians for work in institutions. In addition, the displaced physician may obtain help from the National Committee for Resettlement of Foreign Physicians, 15 Park Row, New York City.

Table 31 records the number of graduates of foreign medical faculties examined for medical licensure in the United States and Alaska in 1951. The figures include both American and foreign born physicians. Graduates of 142 medical schools and 4 licensing corporations were examined. Graduates of medical schools in the Philippines, 11 South and Central American countries, 27 countries in Europe, and 8 in Asia were represented at examinations. The number examined totaled 1,006. These physicians were tested in 34 states and Alaska. The number who were successful was 524; failures numbered 482, or 47.9%. This extremely high percentage of failures is a primary factor in the cautious attitude which has been maintained by licensing boards in admitting these graduates to the licensing examinations.

Graduates of the University of Vienna represented the largest group from any one school. Seventy-seven graduates of this school were examined in 16 states, 50.6% of whom failed. From Central America the school which represented the largest group was the University of Havana. Thirty-five graduates of this school were examined in nine states, with 42.9% failures.

The greatest number examined by any one state was 448 in New York, of whom 192 passed and 256, 57.1%, failed. Illinois examined 174, of whom 47.1% failed, California examined 96, with 41.7% failures, and Ohio examined 80, with 42.5% failures. Other states examined fewer than 33.

Table 32 presents the number of graduates of faculties of medicine abroad examined for medical licensure in the United States in 22 years (1930-1951). In 1936 the number of foreign-trained physicians began to increase, and by 1940 there were over three times as many as were tested in 1936. Beginning in 1944 the numbers examined began to decrease, until 1949 when there was a noticeable increase. In 1951 there were 207 more examined than in the preceding year. At no time in the 22 year period did fewer than 30.7% fail in a given year.

Represented in table 33 are figures regarding the foreign-trained physicians registered in 1951 who were not previously licensed in the United States and who

TABLE 32.—*Physicians Examined on the Basis of Credentials Obtained in Countries Other Than the United States and Canada, 1930-1951*

Year	Number Examined	Passed	Percentage Failed
1930	167	92	44.9
1931	158	91	42.4
1932	182	96	47.3
1933	200	129	35.5
1934	285	170	40.2
1935	437	303	30.7
1936	588	382	35.0
1937	920	637	30.8
1938	1,161	716	38.5
1939	1,691	839	50.4
1940	2,088	948	54.7
1941	1,717	698	59.2
1942	1,630	890	45.4
1943	1,031	518	49.8
1944	691	325	53.0
1945	475	209	56.0
1946	495	221	55.3
1947	601	283	52.9
1948	639	311	51.3
1949	737	319	56.7
1950	799	359	55.0
1951	1,006	524	47.9
Totals	17,701	9,060	43.1

TABLE 33.—*Graduates of Foreign Medical Faculties Representing Additions to the Medical Profession, 1951*

	Examination	Reciprocity or Endosement	Total
Arizona	1	0	1
California	55	0	55
Colorado	1	0	1
Connecticut	2	0	2
District of Columbia	6	3	9
Florida	3	0	3
Illinois	83	0	83
Maryland	6	0	6
Massachusetts	3	2	5
Michigan	1	0	1
Minnesota	6	0	6
Missouri	5	0	5
New Hampshire	0	2	2
New Jersey	6	0	6
New York	181	14	195
North Carolina	1	0	1
North Dakota	7	0	7
Ohio	36	1	37
Rhode Island	4	0	4
South Dakota	1	0	1
Texas	4	1	5
Virginia	8	0	8
Wisconsin	2	0	2
Hawaii	1	0	1
Guam	0	2	2
Virgin Islands	2	0	2
Totals	425	25	450

TABLE 34.—*Additions to the Medical Profession Representing Graduates of Foreign Medical Faculties, 1950-1951*

	Examination	Reciprocity or Endorsement	Totals
1950	267	41	308
1951	425	25	450
Totals	692	66	758

therefore are additions to the medical profession. There were 450 in this group, of whom 425 were licensed by written examination and 25 by endorsement of credentials. Comparative figures for 1950, the first year in which computations were made regarding foreign-trained physicians representing additions to the medical profession, are included in table 34. In this year 308 were new additions to the physician population in the United States. In the two year period, 758 physicians are represented by this group.

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New York	Dr. Stiles D. Ezell, Secretary, 23 S. Pearl St., Albany 7
North Carolina	Dr. Joseph J. Combs, Secretary, 419 Professional Bldg., Raleigh
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Guam	Dr. Austin W. Matthis, Executive Secretary, Agana
Hawaii	Dr. I. L. Tilden, Secretary, 1020 Kapiolani St., Honolulu
Puerto Rico	Mr. Luis Cueto Coll, Secretary, Box 9156, Santurce
Virgin Islands	Dr. Earle M. Rice, Secretary, St. Thomas

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

Nineteen states, the District of Columbia, and Alaska have adopted by legislative action basic science requirements underlying the practice of the healing art. A basic science law provides for the establishment of a board of examiners and requires that each person who desires to practice the healing arts appear before the board and demonstrate his knowledge of the basic sciences. The basic science boards have no licensing powers. A certificate in the basic sciences is a prerequisite to licensure in these states.

The boards comprising this group, together with the year of enactment of the basic science law, are recorded in table 35. Nevada was added to this group in 1951.

The subjects in which examinations are conducted are shown in table 36. These subjects are specified by statute. The examining boards have no authority to add any subjects or to refrain from examining in any subjects, although in some states provision is made for certification without examination, by waiver or exemption. The credentials acceptable for certification without examination are listed in table 37.

The results of examinations given and the number of certificates issued on the basis of reciprocity, endorsement, waiver, or exemption during 1951 are presented in tables 38 and 39. A candidate in applying for a basic science certificate is not required by law to reveal his school of practice. The lists submitted by the respective boards, however, have been checked with the biographic records of physicians and medical students maintained by the American Medical Association and with various directories. In this way it has been possible to determine the profession of the majority of candidates. By this means, the data presented have been tabulated in four groups, namely, physicians and medical students, osteopaths, chiropractors and naturopaths, and unclassified applicants. The last category includes those for whom it was not possible to determine the profession represented. In Rhode Island doctors of dentistry are included in this latter group. It is probable that many in this unclassified group include osteopaths, chiropractors, and also naturopaths who have not been identified by the reference data available.

There were 3,198 candidates examined by the 21 boards in operation in 1951. The numbers examined in the four categories mentioned and the total examined by each board are shown in table 38. The majority (2,810) represented physicians or medical students, 241 were osteopaths, 214 chiropractors or naturopaths, and 668 were placed in the unclassified group. Of all applicants, 39.8% failed. Of the physicians and medical students 11.3% failed, of osteopaths 19%, of chiropractors and naturopaths 62.1%, and of unclassified 35.3%. Among those who were certified, there were 2,491 physicians and medical students, 194 osteopaths, 81 chiropractors or naturopaths, and 432 unclassified candidates. The basic science boards of Iowa, Florida, and Minnesota examined the greatest number of applicants. Iowa examined 1,348, Florida 839, and Minnesota 742. The percentage of failures in these states was 70.6, 26.7, and 56.8 respectively. Alaska had no failures, while the District of Columbia had 4.2% failures. Both of these boards examined only physicians or medical students in 1951.

TABLE 35.—*States Having Basic Science Laws and Year of Enactment*

Alaska	1946	Nevada	1951
Arizona	1936	New Mexico	1941
Arkansas	1929	Oklahoma	1937
Colorado	1937	Oregon	1934
Connecticut	1925	Rhode Island	1940
District of Columbia	1929	South Dakota	1939
Florida	1939	Tennessee	1943
Iowa	1936	Texas	1949
Michigan	1937	Washington	1927
Minnesota	1927	Wisconsin	1925
Nebraska	1927		

TABLE 36.—*Subjects Included in Basic Science Examinations*

	Examinations Required in							
	Anatomy	Bacteriology	Chemistry	Diagnosis	Hygiene	Pathology	Physiology	Public Health
Alaska	x	x	x	..	x	x	x	..
Arizona	x	x	x	..	x	x	x	..
Arkansas	x	x	x	..	x	x	x	..
Colorado	x	x	x	..	..	x	x	..
Connecticut	x	..	..	x	x	x	x	..
Dist. Columbia	x	x	x	..	..	x	x	..
Florida	x	x	x	..	..	x	x	..
Iowa	x	x	x	..	x	x	x	..
Michigan	x	x	x	..	x	x	x	x
Minnesota	x	x	x	..	x	x	x	..
Nebraska	x	x	x	..	x	x	x	..
Nevada	x	x	x	..	..	x	x	..
New Mexico	x	x	x	..	..	x	x	..
Oklahoma	x	x	x	..	..	x	x	..
Oregon	x	..	x	..	x	x	x	..
Rhode Island	x	x	x	..	..	x	x	..
South Dakota	x	x	x	..	..	x	x	..
Tennessee	x	x	x	..	..	x	x	..
Texas	x	x	x	..	x	x	x	x
Washington	x	..	x	..	x	x	x	..
Wisconsin	x	..	..	x	..	x	x	..

TABLE 37.—*Reciprocity, Endorsement, Waiver or Exemption Policies of Basic Science Boards*

	Credentials Accepted
Alaska	Physicians are accepted on reciprocity from the following state medical and/or basic science boards: *Alabama*, Arkansas, California, Colorado, Connecticut, District of Columbia, Indiana, Kansas, Kentucky, Maryland, Michigan, Minnesota, Mississippi, Missouri, Nevada, New Hampshire, New Jersey, North Carolina, North Dakota, Ohio, Oklahoma, Oregon, Tennessee, Texas, Utah, Vermont, Virginia, Washington, West Virginia, Wisconsin.
Arizona	Those who present basic science certificate earned by examination before basic science board of any other state given credit for examinations taken before that board. Those licensed in some other basic science state before the basic science law of that state was adopted if such are covered by a grandfather previous licensure clause in that other state.
Arkansas	Certificate of basic science boards of all states except Florida, Iowa and New Mexico.
Colorado	(*a*) Certificates obtained by examination from the following basic science boards: Arizona, Arkansas, District of Columbia, Minnesota, *Nebraska*, *Nevada*, New Mexico, Oklahoma, Oregon, Rhode Island, South Dakota, Tennessee and Texas. (*b*) Applicants who present basic science certificates from the Connecticut and Wisconsin boards are examined in chemistry and bacteriology. (*c*) Complete reciprocity with the Iowa Basic Science Board is granted to those whose original application was received on or before June 1, 1949. Others must pass four of the five subjects given by the Colorado Board. (*d*) Reciprocity is granted with Alaska to those candidates who have passed, at one sitting, four out of five subjects given by the Colorado board.
Connecticut	No reciprocity. Board may in its discretion waive examination.
District of Columbia	Board may exempt an applicant and accept in lieu of examination proof that the applicant has passed before a basic science or licensing board an examination in subjects required by District of Columbia basic science board. Diplomates of the National Board of Medical Examiners may also be exempt from examination.
Florida	None.
Iowa	Certificate by exemption granted if credentials presented are equal to those of Iowa basic science board.
Michigan	Certificates from Arkansas, Minnesota and Nebraska basic science boards.
Minnesota	(*a*) Certificate of basic science boards of Arizona, Arkansas, Colorado, Michigan, Nebraska, Oklahoma, Oregon, South Dakota, Tennessee and Texas. (*b*) Applicants from Alabama, Georgia, Louisiana and the District of Columbia granted partial credit. (*c*) Medical Boards of Arizona, Indiana, Kentucky, Michigan, Missouri, New York, Oklahoma, Texas, Vermont and Virginia. (*d*) Part I of the examination of the National Board of Medical Examiners.
Nebraska	In the case of states having a basic science law, waiver is based on the results of the basic science examination. Or waiver may be made on the basis of grades obtained before a medical board, if basic science certificate is not held by the applicant. A grade of at least 75 per cent *is necessary* in each of the basic science subjects in which applicants are examined in Nebraska.
Nevada	Certificate of Arizona, Colorado, Iowa, Minnesota, South Dakota, Tennessee and Texas accepted. *The same subjects* as Nevada and a grade of 75 per *cent in each subject are* required for reciprocity or waiver.
New Mexico	Reciprocity with Arizona, Colorado, Oregon and Tennessee and a limited reciprocity with Wisconsin.
Oklahoma	No signed agreements. Candidates are accepted or rejected on the basis of individual qualifications.
Oregon	Certificate in the basic *sciences obtained* by examination in Arkansas, Colorado, Iowa, Minnesota, Nebraska, New Mexico, Oklahoma, South Dakota, Tennessee, Texas and Wisconsin.
Rhode Island	*Endorsement* with Massachusetts Board of Registration in Medicine after oral examination.
South Dakota	Certificate of basic science boards, Arizona, Arkansas, Colorado, Iowa, Minnesota, Nebraska, Nevada, Oklahoma, Oregon, Tennessee, Texas and Wisconsin.
Tennessee	(*a*) Certificate of *basic science* boards of Arizona, Arkansas, Colorado, *District of* Columbia, Minnesota, Nebraska, New Mexico, Oklahoma, Oregon, South Dakota, Texas, Virginia and Wisconsin. (*b*) Granting of a certificate by waiver by accepting grades in required subjects earned by examination before a medical *examining board* or the National Board of Medical Examiners is handled on an individual basis.
Texas	Certificate of basic science boards of Arizona, Arkansas, Colorado, Iowa, Minnesota, Nebraska, Oklahoma, Oregon, South Dakota and Tennessee and partial reciprocity with Wisconsin.
Washington	None.
Wisconsin	(*a*) Certificate of all basic science boards. (*b*) Accepts *certification* on the basis of examination *from* any legally established medical board. (*c*) Accepts examinations of the Medical Council of Canada.

TABLE 38.—*Applicants Examined in Basic Sciences, 1951*

	Physicians and Medical Students		Osteopaths		Chiropractors and Naturopaths		Unclassified and Others		Total Examined	Passed	Failed	Percentage Failed
	P	F	P	F	P	F	P	F				
Alaska	3	0	0	0	0	0	0	0	3	3	0	0.0
Arizona	34	..	3	..	0	..	10	..	56	47	9*	16.1
Arkansas	84	1	22	11	8	6	2	22	156	116	40	25.6
Colorado	141	0	1	0	1	0	10	9	162	153	9	5.6
Connecticut	104	9	1	0	2	23	0	0	139	107	32	23.0
District of Columbia	23	1	0	0	0	0	0	0	24	23	1	4.2
Florida	445	101	33	16	15	8	122	99	839	615	224	26.7
Iowa	152	..	72	..	30	..	141	..	1,348	395	953*	70.6
Michigan	368	60	3	3	1	4	37	26	502	409	93	18.5
Minnesota	208	..	45	..	3	..	64	..	742	320	422*	56.8
Nebraska	88	26	0	1	0	2	7	5	129	95	34	26.4
Nevada	4	2	0	0	0	0	0	0	6	4	2	33.3
New Mexico	33	2	1	1	0	0	5	0	42	39	3	7.0
Oklahoma	77	3	0	0	0	2	0	3	85	77	8	9.4
Oregon	102	36	1	4	3	0	4	28	178	110	68	38.2
Rhode Island**	65	11	1	0	1	0	10	3	91	77	14	15.4
South Dakota	43	7	2	0	0	0	19	25	96	64	32	33.3
Tennessee	188	22	0	0	0	0	1	14	225	189	36	16.0
Texas	82	22	0	1	0	1	0	2	108	82	26	24.1
Washington	66	7	4	2	0	7	0	0	86	70	16	18.6
Wisconsin	181	9	5	8	17	80	0	0	300	203	97	32.3
Totals—Examined	2,810		241		214		668		5,317			
Totals—Passed	2,491		194		81		432			3,198		
Totals—Failed	319		47		133		236				2,119	
Percentage—Failed	11.3		19.0		62.1		35.3					39.8

* Nature of practice undeterminable since names of failures not supplied.
** Figures in unclassified column refer to doctors of dentistry.

TABLE 39.—*Basic Science Certificates Issued by Examination, Reciprocity and Endorsement, 1951*

	Examination					Reciprocity, Endorsement, Exemption or Waiver					
	Physicians and Medical Students	Osteopaths	Chiropractors and Naturopaths	Unclassified and Others	Totals	Physicians and Medical Students	Osteopaths	Chiropractors	Unclassified and Others	Totals	Registered
Alaska	3	0	0	0	3	9	0	3	0	12	15
Arizona	34	3	0	10	47	55	33	4	27	119	166
Arkansas	84	22	8	2	116	48	0	1	0	49	165
Colorado	141	1	1	10	153	41	10	10	8	69	222
Connecticut	104	1	2	0	107	0	0	0	0	0	107
District of Columbia	23	0	0	0	23	81	0	0	0	81	104
Florida	445	33	15	122	615	0	0	0	0	0	615
Iowa	152	72	30	141	395	131	8	11	66	216	611
Michigan	368	3	1	37	409	22	48	9	32	111	520
Minnesota	208	45	3	64	320	139	0	2	0	141	461
Nebraska	88	0	0	7	95	84	0	0	0	84	129
Nevada	4	0	0	0	4	7	0	0	0	7	11
New Mexico	33	1	0	5	39	0	0	0	0	0	39
Oklahoma	77	0	0	0	77	1	0	1	0	2	79
Oregon	102	1	3	4	110	50	6	4	22	82	192
Rhode Island*	65	1	1	10	77	4	0	0	0	4	81
South Dakota	43	2	0	19	64	30	1	4	11	46	110
Tennessee	188	0	0	1	189	99	4	4	2	109	298
Texas	82	0	0	0	82	602	62	25	18	707	789
Washington	66	4	0	0	70	0	0	0	0	0	70
Wisconsin	181	5	17	0	203	100	11	39	0	150	353
Totals	2,491	194	81	432	3,198	1,453	183	117	186	1,939	5,137

* Figures in unclassified column refer to doctors of dentistry.

Arizona, Iowa, and Minnesota do not report the names of applicants who fail examinations. The numbers who fail are, therefore, recorded only in the total column.

Physicians or medical students were examined by all boards, osteopaths by 16 boards, chiropractors by 14 boards, naturopaths by the Connecticut board, dentists by the Rhode Island board, while figures for 15 boards are included in the unclassified group.

TABLE 40.—*Total Candidates for Basic Science Certification, 1927-1951*

		Physicians and Medical Students						Other Practitioners					
	No. of Boards	Examined	Passed	Failed	Percentage Failed	Endorsement	Total Certified	Examined	Passed	Failed	Percentage Failed	Endorsement	Total Certified
1927	5	305	279	26	8.5	26	305	22	15	7	31.8	1	16
1928	5	646	586	60	9.3	19	605	59	31	28	47.5	0	31
1929	7	668	610	58	8.7	75	685	66	31	35	53.0	0	31
1930	7	685	606	79	11.5	118	724	78	30	48	61.5	4	34
1931	7	680	586	94	13.8	141	727	107	48	59	55.1	0	48
1932	7	657	590	67	10.2	106	696	78	44	34	43.6	12	56
1933	8	601	527	74	12.3	121	648	60	30	30	50.0	10	40
1934	9	815	725	90	11.0	127	852	51	26	25	49.0	11	37
1935	10	882	761	121	13.7	110	871	74	33	41	55.4	4	37
1936	10	1,032	891	141	13.7	230	1,121	66	26	40	60.6	13	39
1937	12	1,231	1,061	170	13.8	192	1,253	113	41	72	63.7	10	51
1938	12	1,168	1,026	142	12.2	267	1,293	158	70	88	55.7	26	96
1939	14	1,141	1,013	128	11.2	727	1,740	218	97	121	55.5	294	391
1940	16	1,303	1,140	163	12.5	324	1,464	280	153	127	43.9	22	175
1941	17	1,768	1,560	208	11.8	280	1,840	356	191	165	46.3	73	264
1942	17	1,725	1,476	249	14.4	213	1,689	497	249	248	49.9	91	340
1943	18	2,330	2,098	232	10.0	296	2,394	389	211	178	45.8	86	297
1944	18	2,284	1,868	416	18.2	222	2,090	465	276	189	40.6	87	363
1945	18	2,576	2,146	430	16.6	412	2,558	397	193	204	51.4	172	365
1946	19	2,937	2,391	546	18.7	1,308	3,699	313	167	146	46.6	166	333
1947	19	3,132	2,405	727	23.2	771	3,176	406	228	178	43.8	189	417
1948	19	3,000	2,601	399	13.3	1,069	3,670	827	437	390	47.1	349	786
1949	20	2,932	2,540	392	13.4	940	3,480	2,239	1,116	1,123	50.2	540	1,656
1950	20	2,989	2,627	362	12.1	2,176	4,803	1,781	803	978	54.8	350	1,153
1951	21	2,810	2,491	319	11.3	1,453	3,844	1,123	707	416	37.0	486	1,193
Totals		40,297	34,604	5,693	14.1	11,723	46,255	10,223	5,253	4,970	48.6	3,996	9,249

TABLE 41.—*Basic Science Fees*

Alaska	$25	Nevada	$25
Arizona	20	New Mexico	25
Arkansas	10 [1]	Oklahoma	15 [4]
Colorado	25	Oregon	10
Connecticut	10	Rhode Island	10
District of Columbia	25	South Dakota	15 [2]
Florida	10	Tennessee	10 [5]
Iowa	10	Texas	15 [2]
Michigan	10 [6]	Washington	10
Minnesota	15 [2]	Wisconsin	10 [6]
Nebraska	10 [3]		

1. Reciprocity, $5.
2. Reciprocity, $25.
3. Waiver, $15.
4. Reciprocity, $50.
5. Reciprocity, $5.
6. Reciprocity, $15.

Seventeen boards issued 1,939 certificates by reciprocity, endorsement, waiver, or exemption. The number of successful applicants by examination and by endorsement (5,137) is recorded in table 39. Included in the total certified were 3,844 physicians or medical students and 1,193 others representing osteopaths, chiropractors, naturopaths, and the unclassified group. This latter group included 377 osteopaths, 198 chiropractors, and 618 unclassified candidates.

In 25 years, 40,297 (table 40) physicians and medical students were examined, of whom 34,604 were successful in their examinations. In the same period 5,253 other practitioners were tested and 4,970 were successful. There were 11,723 physicians and medical students issued certificates without examination and 3,996 to other practitioners. In both categories during the 25 year period there were 46,255 certificates issued to physicians and medical students and 9,249 to other practitioners.

The principle of basic science legislation is to provide a means of insuring that all who seek licensure to care for sick and injured persons shall first possess a reasonable knowledge of the sciences fundamental to the healing art. The endorsement of such laws affects mostly the group classified as "other practitioners." This is particularly significant, since the testing is made by nonmedical examiners.

The present executive corresponding officer of each of the 21 basic science boards is as follows:

Arizona	Mr. Francis A. Roy, Secretary, Liberal Arts Bldg., Room 423, University of Arizona, Tucson
Arkansas	Mr. L. E. Gebauer, Secretaiy, 1002 Donaghey Bldg., Little Rock
Colorado	Dr. Esther B. Starks, Secretary, 1459 Ogden Street, Denver
Connecticut	Mr. M. G. Reynolds, Executive Assistant, 110 Whitney Avenue, New Haven 10
District of Columbia	Dr. Daniel L. Seckinger, Secretary, 4130 E. Municipal Bldg., Washington
Florida	Mr. M. W. Emmel, Secretary, University of Florida, Box 340, Gainesville
Iowa	Dr. Ben H. Peterson, Secretary, Coe College, Cedar Rapids
Michigan	Mrs. Anne Baker, Secretary, 423 W. Michigan Avenue, Lansing
Minnesota	Dr. Raymond N. Bieter, Secretary, 105 Millard Hall, University of Minnesota, Minneapolis 14
Nebraska	Mr. Husted K. Watson, Director, Room 1009, State Capitol Bldg., Lincoln 9
Nevada	Mr. Frank Richardson, Secretary, University of Nevada, Reno
New Mexico	Mrs. Marguerite Cantrell, Secretary, P. O. Box 1592, Santa Fe
Oklahoma	Dr. Clinton Gallaher, Secretary, 813 Braniff Bldg., Oklahoma City
Oregon	Dr. C. D. Byrne, Secretary, University of Oregon, Eugene
Rhode Island	Mr. Thomas B. Casey, Administrator, 366 State Office Bldg., Providence
South Dakota	Dr. G. M. Evans, Secretary, 310 East 15th Street, Yankton
Tennessee	Dr. O. W. Hyman, Secretary, 874 Union Avenue, Memphis.
Texas	Bro. Raphael Wilson, Secretary, 407 Perry-Brooks Bldg., Austin
Washington	Mr. J. D. McDougall, Acting Director, Olympia
Wisconsin	Mr. W. H. Barber, Secretary, 621 Ransom Street, Ripon
Alaska	Dr. C. Earl Albrecht, Secretary, Box 1931, Juneau

NATIONAL BOARD OF MEDICAL EXAMINERS

The medical licensing boards of 46 states, the District of Columbia, the territories of Alaska, Hawaii, and Puerto Rico, and the Canal Zone, recognize the certificate of the National Board of Medical Examiners as an adequate qualification for a medical license. Montana was added to this group in 1951. The Medical Practice Act of Wisconsin was amended in 1951 and provides that in lieu of its own examination, the board of medical examiners may accept, either in whole or in part, the certificate of the National Board. The certificate is not recognized by the licensing boards of Florida and Texas. While the National Board reports Texas as one of the states which does not accept its certificate, three physicians were reported as licensed by endorsement of the certificate in 1951.

TABLE 42.—*Licensing Boards Endorsing the Certificate of the National Board of Medical Examiners, 1952*

Alabama
Alaska [3]
Arizona
Arkansas [3]
California
Canal Zone
Colorado
Connecticut [3]
Delaware
Dist. of Columbia [3]
Georgia
Hawaii [1]
Idaho
Illinois [1]
Indiana
Iowa [3]
Kansas
Kentucky
Louisiana [4]
Maine [2]
Maryland
Massachusetts
Michigan [2]
Minnesota [3]
Mississippi
Missouri
Montana
Nebraska [3]
Nevada
New Hampshire
New Jersey
New Mexico
New York
North Carolina
North Dakota
Ohio
Oklahoma
Oregon
Pennsylvania
Puerto Rico
Rhode Island [1]
South Carolina
South Dakota
Tennessee [3]
Utah
Vermont
Virginia
Washington
West Virginia
Wyoming [1]

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1. Oral examination required.
2. Brief supplemental written examination required.
3. Examination in basic sciences accepted by state basic science board.
4. Licensure in a state with which Louisiana reciprocates required.

Some states exact additional requirements, i. e., a basic science certificate, proof of citizenship and an internship of one year. These are general requirements of all candidates for licensure.

Delaware requires that the National Board diplomates have two years of medical practice to qualify for licensure. Louisiana exempts diplomates from the state examination if they have been licensed in some other state with which Louisiana reciprocates. The laws or regulations of the licensing boards in Hawaii, Illinois, Rhode Island, and Wyoming require diplomates of the National Board to take an oral examination. A brief supplemental written examination is required in Maine and in Michigan. The states, territories, and possessions which will endorse the National Board certificate are recorded in table 42.

TABLE 43.—*National Board Examinations, 1916-1921*

Year	Total Examined	Passed	Failed	Percentage Failed
1916	10	5	5	50.0
1917	40	31	9	22.5
1918	59	51	8	13.8
1919	52	51	1	1.9
1920	108	82	26	24.0
1921	56	48	8	14.2
Totals	325*	268	57	17.5

* Represents eleven examinations.

In addition to the boards of medical licensure, 19 states, the District of Columbia, and Alaska have established separate examining boards in the basic sciences. The laws of nine of these boards are sufficiently broad to enable them to accept the examinations of the National Board in lieu of their own. These include the boards of Alaska, Arkansas, Connecticut, Iowa, Minnesota, Oklahoma, Tennessee, and the District of Columbia. The Nebraska board accepts the National Board's examinations in most instances after reviewing the answer papers.

The board's examinations are also accepted by many medical schools as part of their own examination and promotion procedures, and other schools recommend that they be taken. Some schools require students to pass part 1 at the end of the second academic year and part 2 at the end of the fourth year. Other schools require only that part 2 be passed by the end of the fourth year. There are a few schools at which those students who voluntarily take and pass the board's examinations either in part 1 or 2 are excused from the corresponding final school examinations.

The National Board admits to its examination those students who are enrolled in or who have graduated from (*a*) medical schools in the United States and Canada approved by the Council on Medical Education and Hospitals of the American Medical Association, (*b*) the university medical schools of Great Britain and Ireland, and (*c*) foreign medical schools considered acceptable by the Council on Medical Education and Hospitals of the American Medical Association and the Association of American Medical Colleges.

TABLE 44.—*National Board Examinations in Part 1, 1922-1951*

Date	Total Examinations	Passed	Incomplete	Failed	Percentage Failed
February 1951	394	332	34	28	7.1
June 1951	2,255	1,271	774	210	9.3
September 1951	871	550	230	91	10.5
Totals	3,520	2,153	1,038	329	9.3
1922	388	263	58	67	20.3
1923	507	349	77	81	18.8
1924	591	415	69	107	20.5
1925	608	400	50	158	28.3
1926	625	436	104	85	16.3
1927	702	452	159	91	16.8
1928	843	533	231	79	12.9
1929	1,096	675	331	90	11.8
1930	1,260	801	345	114	12.5
1931	1,277	755	425	97	11.4
1932	1,307	847	371	89	9.5
1933	1,234	782	316	136	14.8
1934	1,241	809	347	85	9.5
1935	1,264	785	410	69	8.1
1936	1,344	858	363	123	12.5
1937	1,435	871	415	149	14.6
1938	1,654	986	508	160	14.0
1939	1,733	1,048	460	225	17.7
1940	1,653	1,069	375	209	16.4
1941	1,640	1,087	346	207	16.0
1942	1,867	1,204	471	192	13.8
1943	2,656	1,441	962	253	14.9
1944	4,229	2,326	1,465	438	15.9
1945	3,865	2,106	1,475	284	11.8
1946	3,148	1,695	1,189	264	13.5
1947	3,514	1,844	1,352	318	14.7
1948	3,807	2,178	1,262	367	14.4
1949	3,823	2,337	1,243	243	9.4
1950	3,678	2,358	986	334	9.0
1951	3,520	2,153	1,038	329	9.3
Totals	56,509	33,863	17,203	5,443	9.6

Data regarding the examinations conducted and the issuance of certificates by the National Board are presented for the 30th consecutive year.

TABLE 45.—*National Board Examinations in Part 2, 1922-1951*

Date	Total Examinations	Passed	Incomplete	Failed	Percentage Failed
February 1951	222	216	0	6	2.7
April 1951	1,360	1,349	0	11	0.8
June 1951	453	452	0	1	0.2
Totals	2,045	2,017	0	18	1.4
1922	109	90	0	19	17.4
1923	192	170	2	20	10.5
1924	267	227	0	40	15.0
1925	342	309	0	33	9.6
1926	381	334	1	46	12.1
1927	361	314	1	46	12.8
1928	410	371	1	38	9.3
1929	465	399	19	47	10.5
1930	620	543	7	70	11.4
1931	719	630	2	87	12.1
1932	732	674	0	58	7.9
1933	714	651	0	63	8.8
1934	633	583	0	50	7.9
1935	689	620	0	69	10.0
1936	768	716	2	50	6.5
1937	855	803	1	51	6.0
1938	861	815	0	46	5.3
1939	938	884	0	54	5.8
1940	1,028	963	9	56	5.5
1941	1,001	954	1	46	4.6
1942	1,072	1,031	0	41	3.8
1943	1,861	1,805	0	56	3.0
1944	1,405	1,350	0	55	3.9
1945	1,599	1,565	0	34	2.1
1946	1,825	1,782	0	43	2.4
1947	1,641	1,613	0	28	1.7
1948	1,742	1,725	0	17	0.9
1949	1,737	1,691	0	46	2.6
1950	1,863	1,837	0	26	1.3
1951	2,045	2,017	0	28	1.4
Totals	28,875	27,466	46	1,363	4.7

The National Board of Medical Examiners was founded in 1915 by Dr. W. L. Rodman, then President of the American Medical Association. The first examination for certification was given in October, 1916. From that date up to and including a test given in June, 1921, a total of 11 examinations were given and 268 candidates were certified. The numbers examined during this period are recorded in annual figures in table 43.

Since 1922 the examination has been divided into three parts, which must be taken and completed in the following sequence: part 1, a written examination in six basic science subjects; part 2, a written examination in six major clinical divisions and their component subjects or subdivisions, and part 3, an oral and practical evaluation of the candidate's ability in critical observation, in diagnostic acumen, and in the principles of therapy. The examination in part 3 is divided in four periods, allocated to the following four major elements of general practice: clinical medicine, pediatrics, clinical surgery, and obstetrics.

Examinations in parts 1 and 2 are held in the winter and late spring at medical schools in the United States and Canada. An additional examination in part 1 is held in September. These examinations are held at those medical schools that can conveniently accommodate them, if five or more candidates have registered. The examinations in part 3 are given under the direction of local subsidiary boards in 29 centers at times that are announced well in advance of the date of the examination. The dates of all examinations are posted on college bulletin boards and published in THE JOURNAL and in *The Diplomate.*

The tables that are hereinafter presented refer to the results of examinations in parts 1, 2, and 3 for each calendar year since 1922, including those who passed and failed examinations and those certified as well as other pertinent data.

A candidate is eligible for part 1 who has completed successfully the first two years of work in an approved medical school. Candidates are required to take all six basic science subjects of part 1 at one examination period unless entitled to take an incomplete examination. An incomplete examination is allowed candidates taking part 1 at the end of their second medical year in schools whose third year curricula include courses in one or two subjects of this part. The examinations in the subjects not yet completed are postponed and may be taken at any examination period after the candidate has completed them in his medical school. They are recorded in these tabulations under the heading "Incomplete Examinations" and are excluded from the calculations referring to the percentage of failures.

TABLE 46.—*National Board Examinations in Part 3, 1922-1951*

Year	Total Examinations	*Passed*	*Failed*	Percentage *Failed*
1922	22	22	0	0.0
1923	82	81	1	1.2
1924	126	120	6	4.8
1925	219	206	13	5.9
1926	255	243	12	4.7
1927	293	272	21	7.2
1928	322	306	16	5.0
1929	352	337	15	4.3
1930	420	401	19	4.5
1931	437	419	18	4.1
1932	550	522	28	5.1
1933	551	526	25	4.5
1934	567	548	19	3.4
1935	598	578	20	3.3
1936	576	547	29	5.0
1937	668	630	38	5.7
1938	706	682	24	3.4
1939	770	729	41	5.3
1940	792	771	21	2.7
1941	910	885	25	2.7
1942	1,054	1,041	13	1.2
1943	1,230	1,213	17	1.4
1944	1,168	1,146	22	1.8
1945	1,245	1,232	13	1.0
1946	1,634	1,613	21	1.2
1947	1,741	1,723	18	1.0
1948	1,715	1,700	15	0.9
1949	1,685	1,674	11	0.6
1950	1,752	1,736	16	0.9
1951	1,738	1,708	30	1.7
Totals	24,178	23,611	567	2.3

A candidate is eligible for part 2 who has passed part 1 and has completed successfully a four year medical course.

TABLE 47.—*Diplomates from Individual Medical Schools, 1951*

United States	
Medical College of Alabama	6
College of Medical Evangelists	35
Univer. of Southern California	3
Stanford University	6
University of Colorado	3
Yale University	43
Georgetown University	77
George Washington University	74
Howard University	10
Emory University	8
Chicago Medical School	4
Northwestern University	23
Stritch School of Medicine	8
University of Chicago	29
University of Illinois	31
Indiana University	3
State University of Iowa	11
University of Kansas	1
University of Louisville	6
Tulane University	10
Johns Hopkins University	15
University of Maryland	4
Boston University	52
Harvard Medical School	103
Tufts College Medical School	92
University of Michigan	12
University of Minnesota	4
St. Louis University	11
Washington University	12
Creighton University	11
University of Nebraska	6
Albany Medical College	51
State University of New York, New York City	96
University of Buffalo	66
Columbia University	90
Cornell University	39
New York Medical College	93
New York University	103
University of Rochester	44
State Univ. of N. Y., Syracuse	39
Duke University	55
Bowman Gray School of Med.	1
University of Cincinnati	1
Western Reserve University	6
Ohio State University	11
University of Oregon	5
Hahnemann Medical College	74
Jefferson Medical College	22
Temple University	47
University *of Pennsylvania*	25
Woman's Medical College	26
University *of Pittsburgh*	5
Medical College of S. C.	1
Meharry Medical *College*	2
Vanderbilt *University*	2
Baylor University	3
University of Utah	2
University *of Vermont*	16
University *of Virginia*	7
Medical College of Virginia	2
University of Wisconsin	2
Marquette University	7
Canada	
Dalhousie University	4
Queen's University	2
University of Western Ontario	4
University of Toronto	8
McGill University	21
University of Montreal	3
Foreign	
Cheeloo University	1
University of Birmingham	1
University of Cambridge	1
University of London	1
St. Bartholomew's Hospital Medical College	1
Trinity College	1
University of Rome	1
University of Edinburgh	1
University of Glasgow	2
University of Lausanne	1

A candidate is eligible for part 3 if he has (*a*) passed parts 1 and 2, (*b*) received the degree of Doctor of Medicine, and (*c*) served at least one year as an intern in a hospital approved by the American Medical Association or by the Canadian Medical Association. Under special circumstances, consideration may be given to service in a laboratory, the nature of which is acceptable to the National Board as the equivalent of hospital service.

Tables 44 and 45 record the results of examinations given in parts 1 and 2 during 1951 and for each year since 1922. The data shown represent examinations conducted rather than persons examined. The tabular data include candidates who fail and are reexamined during the same year and those who pass parts 1 and 2 in the same year.

In 1951, 3,520 examinations were given in part 1; 2,153 passed, and 329, or 9.3%, failed. There were 1,038 incomplete examinations given. In part 2, 2,045 examinations were held; 2,017 passed, and 18, or 1.4%, failed. Incomplete examinations are seldom given in this part. There were none in 1951.

Since 1922 a total of 56,509 examinations have been given in part 1 and 28,875 in part 2. During this period 33,863 passed part 1 and 27,466 passed part 2. In the 30 year period shown, there have been 5,443 failures in part 1 (9.6%), and 1,363 (4.7%) in part 2. The increasing recognition of the National Board's examinations is reflected in the figures presented in these two tables, particularly since 1943. The greatest number of examinations was given in part 1 in 1944, when medical schools were operating on an accelerated program. In 1951 the numbers examined in part 2 exceeded all previous years.

In 1951, 1,738 tests were given in part 3; 1,708 passed, and 30 (1.7%) failed. Results of examinations in part 3 in 1951 and in the 29 preceding years are given in table 46. In 30 years, 24,178 were tested, of whom 23,611 were granted the certificate of the board. The percentage of failures in this final examination in 30 years was 2.3.

The 1,708 physicians certified as diplomates in 1951 represented 62 medical schools in the United States, 6 in Canada, and 10 medical schools of other countries. The school and the number of examinees from each are included in table 47.

TABLE 48.—*Parts 1, 2 and 3, Excluding Duplications, 1922-1951*

Year	Total Examinations	Passed	Incomplete	Failed	Percentage Failed
1922	525	381	58	86	18.4
1923	775	594	79	102	14.7
1924	978	756	69	153	16.8
1925	1,167	915	50	202	18.1
1926	1,161	930	105	126	11.9
1927	1,248	947	142	159	14.4
1928	1,430	1,101	211	118	9.7
1929	1,723	1,280	319	124	8.8
1930	2,044	1,547	322	175	10.2
1931	2,218	1,632	410	176	9.7
1932	2,342	1,850	355	137	6.9
1933	2,277	1,806	280	191	9.6
1934	2,261	1,801	330	130	6.7
1935	2,368	1,831	408	129	6.6
1936	2,517	1,989	353	175	8.1
1937	2,735	2,151	397	187	8.0
1938	2,992	2,308	493	191	7.6
1939	3,221	2,476	443	302	10.9
1940	3,188	2,597	363	228	8.1
1941	3,318	2,749	332	237	7.9
1942	3,607	3,014	391	202	6.3
1943	4,514	3,671	606	237	6.1
1944	5,363	4,235	759	369	8.0
1945	5,614	4,468	886	260	5.5
1946	5,912	4,730	898	284	5.7
1947	6,249	4,965	1,002	282	5.3
1948	6,389	5,194	902	293	5.3
1949	6,493	5,376	880	237	4.2
1950	6,596	5,630	665	301	4.5
1951	6,602	5,601	699	302	4.5
Totals	97,827	78,525	13,207	6,095	6.2

The figures presented in the preceding tables represent examinations given. The number of persons tested during any one year is recorded for the 30 year period in table 48. The classifications "Passed" or "Failed" in cases in which more than one examination has been taken in a given year are based on the results of the last examination during the year in question. Thus, if in 1951 a candidate passed part 1 but at a subsequent examination in 1951 he failed part 2, he is computed in this tabulation as having failed. On this basis figures computed indicate that there were 6,602 persons who took at least one of the tests of the National Board in 1951 as compared with 525 in 1922. The trend has been steadily upward. For the 30 year period, 97,827 persons were examined in one or more of the annual examinations, of whom 78,525 passed, 13,207 took incomplete examinations, and 6,095 (6.2%) failed.

TABLE 49.—*Licenses Granted on the Basis of National Board Certificates, 1951*

Alabama	12	New Hampshire	22
Arizona	5	New Jersey	126
Arkansas	3	New Mexico	6
California	216	New York	580
Colorado	22	North Carolina	28
Connecticut	114	North Dakota	4
District of Columbia	76	Ohio	87
Georgia	21	Oklahoma	4
Idaho	2	Oregon	21
Illinois	83	Pennsylvania	147
Indiana	16	Rhode Island	17
Iowa	17	South Carolina	7
Kansas	20	South Dakota	2
Kentucky	12	Tennessee	14
Maine	21	Texas	3
Maryland	51	Utah	6
Massachusetts	203	Vermont	7
Michigan	46	Virginia	42
Minnesota	48	Washington	31
Mississippi	5	West Virginia	18
Missouri	29	Wyoming	2
Montana	2	Alaska	2
Nebraska	9	Hawaii	10
Nevada	1	Puerto Rico	14
Total			2,234

In 1951, there were 2,234 licenses to practice medicine issued by endorsement of the certificate of the National Board of Medical Examiners in 44 states, the District of Columbia, Alaska, Hawaii, and Puerto Rico. The number registered by each of these licensing boards is recorded in table 49. There have been 22,159 licenses issued on the basis of endorsement of the board's certificate by the various states, territories, and outlying possessions since 1915.

The constitution of the board provides for a membership of 32 persons, representing the federal services, the Federation of State Medical Boards of the United States, the Association of American Medical Colleges, the Council on Medical Education and Hospitals of the American Medical Association, and members elected at large. The officers of the Board are:

Howard T. Karsner, M.D., President

John P. Hubbard, M.D., Executive Secretary and Treasurer

J. Stewart Rodman, M.D., Medical Secretary

Everett S. Elwood, Editor and Consultant on State Board Relations.

The address of the board is 225 South 15th Street, Philadelphia 2.

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THE FIFTIETH ANNUAL REPORT ON MEDICAL LICENSURE

The 50th annual report on medical licensure by the Council on Medical Education and Hospitals, which appears in this issue of THE JOURNAL, presents statistics concerning the medical examination and licensure of physicians in the United States and its territories and outlying possessions for the year 1951 and summarizes trends over many years. There is also included information pertaining to the current regulations for medical licensure.

During the year 1951 there were 12,008 licenses to practice medicine issued by the medical examining boards of the 48 states, the District of Columbia, Alaska, Hawaii, Puerto Rico, Guam, the Virgin Islands, and the Canal Zone. Of the 12,008 licenses issued, 5,713 were granted after written examination and 6,295 by reciprocity or endorsement of state licenses or the certificate of the National Board of Medical Examiners. There was a decrease of 201 in the number of physicians licensed in 1951 as compared with the previous year, although the number of licenses granted exceeded the average annual prewar registration by more than 3,000.

The data presented indicate that last year 6,325 physicians received their first license to practice medicine and thus represent additions to the medical profession. In the same period there were about 3,700 deaths of physicians reported, so that there was a net gain of 2,625 in the physician population in the United States and its territories and outlying possessions. The figure represents an increase of 417 in comparison with the net increase in 1950.

The percentage of failures in the written examination from existing approved medical schools in the United States was 2.9%; of graduates of approved medical schools in Canada 11.8% failed; of the graduates of approved medical schools no longer in operation 7.2% failed; 74.2% of the graduates of unapproved medical schools in the United States failed; the graduates of schools of osteopathy admitted to medical licensure examinations in several states had 23.3% failures, and 47.9% of the foreign trained physicians examined for medical licensure last year failed. The total percentage of failures was 11.7%.

The report includes the preprofessional and professional educational requirements of each licensing board, the states requiring an internship for licensure, regulations pertaining to the registration of interns and residents, licensure on the basis of government credentials, the issuance of temporary permits, and states requiring annual registration of physicians.

The second section of the report pertains to the results of examinations given by the 21 boards of examiners in the basic sciences. Certificates of proficiency in the basic sciences were issued to 5,137 candidates in 1951. Of these certificates, 3,198 were issued after written examination and 1,939 by exemption, waiver, reciprocity, or endorsement. Among graduates of approved medical schools in the United States, foreign trained physicians, graduates of unapproved medical schools in the United States, and medical students who took the written test, 11.3% failed. There were 37% failures in written examination by other practitioners.

The final section of the report deals with the examinations given by the National Board of Medical Examiners. The examination of the National Board is given in three parts; the first part may be taken after completion of the sophomore year in medical school, the second part on completion of the medical course, and the third part after a year of hospital service. There were 6,602 persons who took at least one of the tests of the National Board in 1951, and 1,708 physicians were certified as diplomates. The medical licensing boards of 46 states, the District of Columbia, Alaska, Hawaii, Puerto Rico, and the Canal Zone recognize the certificate of the National Board of Medical Examiners as an adequate qualification for a medical license. In 1951, there were 2,234 licenses to practice medicine issued by endorsement of the certificate of the National Board in 44 states, the District of Columbia, Alaska, Hawaii, and Puerto Rico, representing graduates of 62 medical schools in the United States, 6 in Canada, and 10 medical schools of other countries.

The presentation of this study is made available through the cooperation of the various examining and licensing boards. For their cooperation the Council and THE JOURNAL wish to express appreciation.

LICENSURE OF GRADUATES OF FOREIGN MEDICAL SCHOOLS

A study of the current report on medical licensure reveals that in many states the licensure of foreign trained physicians has been given serious consideration by the authorities and that methods have been devised to provide for licensure of qualified foreign trained physicians without lowering the standards of medical practice in the United States. Four states that heretofore did not license foreign trained physicians have specified that they may file applications. In several other states the regulations have been modified. Of the 43 boards that license foreign trained physicians, 9 do not require citizenship, 12 require that the applicant file first citizenship papers only, and 22 boards require full citizenship. Twenty-eight boards indicate the foreign trained physician must serve an internship or obtain further medical training in the United States.

The current list of 49 foreign medical schools in 13 countries compiled by the Council on Medical Education and Hospitals in collaboration with the Executive Council of the Association of American Medical Colleges is included in the report. These two bodies recommend that graduates of these schools be considered on the same basis as graduates of approved medical schools in the United States. The initial list of foreign medical schools was published in February, 1950, and the current list represents the third revision. The present list is not final, and other schools will be added as information is obtained on which to base an evaluation. The position of the Council and the Executive Council with respect to schools not listed is that they neither approve nor disapprove these schools. Until an evaluation is possible, it is the responsibility of individual institutions and organizations in the United States to place their own evaluation on the credentials presented.

Twenty-three licensing boards have reported the acceptance of this list in the consideration of applicants for licensure. Twelve of these boards stipulate that recognition is limited to graduates of schools on the list; two boards specify that graduates of foreign medical faculties after Jan. 1, 1940, are not eligible for licensure unless they have graduated from a school on the published list or have done some special work in an approved medical school in the United States or in a recognized hospital; and one board will accept other graduates if they possess either a certificate of the National Board of Medical Examiners or one of the American Boards in the specialties. The remaining eight boards have reported they accept the list but do not specify whether they also accept graduates of other schools.

Last year graduates of 142 foreign medical schools and 4 licensing corporations of Great Britain were examined. Graduates of medical schools in the Philippines, 11 South and Central American countries, 27 countries in Europe, and 8 in Asia were represented at examinations. The number examined totaled 1,006. These physicians were tested in 34 states and Alaska. The number who were successful was 524; failures numbered 482, or 47.9%. Of the 524 foreign trained physicians licensed in 1951, 450 were not previously licensed in the United States and therefore represent additions to the physician population in the United States. In the previous year, there were 308 additions to the profession from this group.

ACTH AND CORTISONE IN HYPERSPLENIC SYNDROMES

Considerable evidence has been accumulated to suggest that corticotropin and cortisone may be of practical therapeutic significance in the cytopenias of hypersplenism, particularly idiopathic thrombocytopenic purpura. This is in contrast to the ineffectiveness of these hormones in thrombocytopenic purpura when the marrow is hypoplastic, or when there has been depression of platelet formation by chemical intoxication or irradiation.

Robson and Duthie [1] administered corticotropin to two patients with idiopathic thrombocytopenic purpura. Definite clinical remission was induced on three occasions in these two patients. Bethell and his co-workers [2] reported on six patients with idiopathic thrombocytopenic purpura in whom administration of corticotropin or of cortisone resulted in complete clinical and hematological remissions. In three of the patients remissions have persisted for periods of four to six months. In two patients with splenic neutropenia and arthritis (Felty's syndrome) relapse occurred in less than two weeks after the discontinuation of corticotropin therapy. These authors conclude that the spleen exerts a regulatory action, susceptible of derangement, on the maturation and release of granulocytes and thrombocytes, and that this function may be under the control of the adrenal cortex.

Wintrobe and his co-workers [3] noted in a patient with idiopathic thrombocytopenic purpura a rise in the platelet count on administration of corticotropin, with reduction of the bleeding time to normal and improved clot retraction, but the changes that followed the subsequent splenectomy were much more pronounced. Faloon and associates [4] administered corticotropin to three patients with thrombocytopenia. Two of these were adolescent girls, and one was a man 58 years old who had had no remission in thrombocytopenia or vascular fragility following splenectomy one year previously. All showed prompt improvement in vascular fragility. In the two girls, platelet counts and associated coagulation findings subsequently became normal, but no improvement occurred in the thrombocytopenia of the man. In all three patients discontinuance of corticotropin therapy was followed within a short time by a return of the hemostatic defects. One of the girls was subsequently given cortisone orally, with maintenance of normal vascular resistance but with almost complete relapse in thrombocytopenia and associated abnormalities. In addition, these authors administered cortisone to a woman 66 years old who had had a temporary remission of thrombocytopenia following splenectomy six years previously. While her capillary resistance approached normal, there were no changes in the platelet count or coagulation phenomena. These workers suggest that different adrenal hormones may be responsible for improvement in the vascular resistance and the platelet counts respectively.

Evans and Liu [5] reported two remissions following corticotropin therapy in a patient with severe primary thrombocytopenic purpura who had undergone splenectomy. On the basis of these results they suggest that the disease may be due to an abnormal immune response. Jacobson and Sohier [6] noted that in three patients with idiopathic thrombopenic purpura, one of whom had undergone splenectomy, administration of corticotropin or of cortisone caused a prompt rise in platelets. However, on withdrawal of the hormones, the original hematological status returned within a relatively short time. The authors suggest that these hormones may be used for preparing a patient for a splenectomy so that the operation may be performed in the presence of a normal number of platelets of endogenous origin, or if splenectomy is not indicated or the spleen has already been removed, either hormone could be administered to tide the patient over a critical bleeding episode.

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[1] Robson, H. N., and Duthie, J. J. R.: Capillary Resistance and Adrenocortical Activity, Brit. M. J. **2**: 971 (Oct. 28) 1950.

[2] Bethell, F. H.; Miller, S., and Meyers, M. C.: Administration of ACTH and Cortisone in Hypersplenic Syndromes, Proceedings of the Second Clinical ACTH Conference, Philadelphia, the Blakiston Company, 1951, vol. 2, p. 173.

[3] Wintrobe, M. M., and others: Effects of ACTH on Hematopoietic System, Blood **5**: 789 (Aug.) 1950.

[4] Faloon, W. W.; Greene, R. W., and Lozner, E. L.: Hemostatic Defect in Thrombocytopenia as Studied by the Use of ACTH and Cortisone, J. Clin. Investigation **30**: 638 (June) 1951.

[5] Evans, R. S., and Liu, C. K.: Effect of Corticotrophin on Chronic, Severe Primary Thrombocytopenic Purpura, A. M. A. Arch. Int. Med. **88**: 503 (Oct.) 1951.

[6] Jacobson, B. M., and Sohier, W. D.: Effects of ACTH and Cortisone on Platelets in Idiopathic Thrombopenic Purpura, New England J. Med. **246**: 247 (Feb. 14) 1952.

The mode of action of corticotropin and cortisone on the hemopoietic system is still obscure. Wintrobe[7] points out that the cortical hormones may exert a potentiating and regulating effect, influencing many body processes for which they are not essential. Hence in certain hematopoietic disorders, the response might vary with the nature and severity of the underlying process and whether resistance to the effects of the drugs develops.

EXPERT MEDICAL ADVICE FOR FOREIGN COUNTRIES

The United States of America has been particularly fortunate as its health activities have increased. The availability of education, the flow of materials for production, and the high standards of living have permitted this nation to assume a leadership of which it can be proud. And yet at the same time this leadership can be a means of flagrant abuse if it is not closely watched. For example, countries that are temporarily less fortunate but who wish help so that they too can apply the benefits of modern knowledge to their people may turn to the United States for advice. If the services of properly qualified persons are proffered, the outcome will be satisfactory to all. Too often, however, when one government seeks help from another, the wrong "experts" are sent in response. Instead of men and women who are qualified on the basis of actual experience, others who qualify simply because they hold the right titles in some organization or seem deserving of a junket with expenses paid are dispatched, sometimes with attendant publicity. There have been reports of so-called experts being sent to give advice in other countries on health topics in which they had not had any experience other than possibly some administrative background. This situation at best can only cause bewilderment, but, at worst, which usually is the case, it will cause resentment and ill will. When India, for example, requests expert advice on some of its problems, it truly desires the advice of experienced clinicians and health workers and not the conjectural reasoning of some swivel-chair theorist. It is a serious mistake to send someone who must first gain experience in the area to which he is sent in response to a call for help. The chances are excellent that the men and women in his new locality already know more from experience than he can possibly learn while he remains there. The inquiring country will certainly not believe it has a high standing in the eyes of the nation to which it appealed if it receives second rate or third rate advisers.

Sometimes voluntarily formed teams from universities, clinics, public health centers, or elsewhere are sent to areas needing help. These teams usually have their expenses paid, but it is not unusual to learn of men and women who go at their own expense. These are almost without exception composed of fully qualified scientists. Unfortunately, there are not many persons in these days of high taxes who can afford to sacrifice so much time and money. There is, however, a potential group of experts who would be delighted to provide help if their advice was sought; and it would cost little to acquire their services, perhaps only traveling expenses and a modest stipend for living, which could be promised even by the country seeking help if it were permitted to choose its own experts when it asked for expert guidance. This group consists of the men and women about to retire from their normal activities, whether it be medical practice or university or other life. Many would welcome the opportunity to offer their services for a few weeks or months or even for several years if they could be assured of living and incidental expenses.

Another source of criticism that has been reported has been the additional gratuitous and often misleading advice on other medical matters that has been given by falsely labeled experts even though they were not asked for such advice. Representatives of at least two countries have complained within the past few months that these so-called experts have promptly proceeded to tell the countries they were visiting how to organize their medical services, although they were sent only for a specific health problem. In each instance there was suggested a plan that would provide compulsory health insurance and full-time salaried physicians. Whether the visitors went as "experts" or propagandists seemed uncertain to the complainants.

The United States and the World Health Organization, which the United States supports, have many opportunities to share their knowledge on health matters so that persons all over the world can benefit. It would be a source of utmost regret if these opportunities were lost because of ill-conceived acts by their representatives.

THE INTERNATIONAL LABOR ORGANIZATION

In the Organization Section of this issue of THE JOURNAL there is an important statement from the World Medical Association. It concerns the International Labor Organization and certain fundamental principles for medical care. This organization is showing signs of increasing interest in medical care, and the members of the medical profession should be aware of this interest and the ways in which it might be made plainly evident in their countries. During June a conference will be held by the International Labor Organization in Geneva, and it is possible that from this meeting there may stem recommendations not in keeping with the principles for which American medicine has long fought. According to the statement issued by the World Medical Association, physicians in the United States are not alone in their desire to preserve freedom for patients and themselves; physicians elsewhere in the world have the same concern. Therefore, the medical profession in all 43 member countries of the World Medical Association will find much of interest in the statement on page 488 from their international medical association.

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[7] Wintrobe, M. M.: ACTH and Cortisone in Hemopoietic Disorders, Am. J. Med. 9:715 (Dec.) 1950.

THE PRESIDENT'S PAGE

In another week, the largest medical meeting held anywhere in the world will convene in Chicago. It is the Annual Session of the American Medical Association, which is meeting for the 101st time. About 14,000 physicians are expected to register. The total number of persons arriving for the convention, including Auxiliary members, exhibitors, and guests, will exceed 28,000. The annual sessions are so large that only four cities in the country can handle them—Chicago, New York, Atlantic City, and San Francisco.

Statistics regarding the coming Chicago meeting are staggering. Most scientific activities are scheduled for Navy Pier, a long hall (five-eighths of a mile) with few facilities other than walls and a roof. This means the Association must bring in over 16,928 feet of partitions for meeting rooms, 10,000 chairs, and its own motion picture screens, projectors, sound equipment, podiums, and blackboards. It must black out 9,800 window panes to provide for movies, lantern slides, and television. It must even provide such trivia as water pitchers, glasses, and brooms. If the scheduled scientific and technical exhibits could be placed end to end, they would stretch for more than three miles!

Size, however, is not the goal but rather the result of the excellence and variety of the scientific programs presented at A. M. A. sessions. Since the Association includes all branches of medicine within its membership, the Annual Session must provide material of interest and significance to all physicians. Its success in achieving this goal is proved by the ever-growing popularity of the meetings.

Physicians attending the convention will have the opportunity to hear two days of general scientific lectures and three days of programs in the specialties. They can view more than 700 scientific and technical exhibits. On receivers in Navy Pier doctors will be able to watch surgical and clinical procedures televised in color from Wesley Memorial Hospital. A full five day program of medical motion pictures will be offered.

In addition, the House of Delegates will be meeting at the Palmer House during convention week. It will be faced by important policy decisions.

On Tuesday night the new President, Dr. Louis H. Bauer, will be installed. At the same time the Association will present its Distinguished Service Medal to a physician who has made an outstanding contribution to the science of medicine. These ceremonies will be broadcast over two coast-to-coast radio networks. Following this program, a half-hour television show will originate at Navy Pier to give physicians at home and the general public a glimpse behind the scenes at an A. M. A. convention. Another half-hour show will be televised over the NBC-TV network on Wednesday evening.

During convention week, too, the Woman's Auxiliary holds its annual meeting; guided tours will be conducted daily at A. M. A. headquarters; a daily convention newspaper will be published; and many related organizations will hold meetings. For the first time this year the National Association of Science Writers is meeting in conjunction with the A. M. A. Session.

You can see from this sketch that an A. M. A. convention is a great and complex production; yet, if all goes as usual, the multitudinous activities of convention week will proceed effectively and smoothly. This is no accident. The headquarters staff at A. M. A. begins working on a convention three years in advance, and it is their painstaking efforts, plus the cooperation of local committees on arrangements, which preface the smooth performance.

Arrangements for meeting rooms, exhibit space, and hotel accommodations are made very early by the Secretary and Business Manager. It is necessary to tie up practically all hotel rooms in a convention city to handle the influx of physicians. The Secretary's Office also serves the House of Delegates. Reports to the House and resolutions to be introduced must be printed in an advance handbook for the delegates. Arrangements have to be made for registration, credentials, and badges. During House sessions, multiple copies of new resolutions must be prepared, and reports of reference committees have to be transcribed and typed. A corps of top secretaries from the various departments of the Association is recruited to assist the Secretary's Office staff with this voluminous work.

All arrangements for the technical exposition are handled by the Advertising Department, which regularly works with the exhibiting companies, most of whom advertise in A. M. A. publications. This department also prepares promotion pieces used to publicize A. M. A. meetings to physicians.

Registration of physicians and guests at the Convention (and it is no small task to register some 25,000 persons in five days) is handled by the Membership Records Department of the A. M. A. Before receiving his badge, each physician's membership status must be checked.

Press and magazine publicity for the convention is handled by the Public Relations Department, which maintains press rooms at both the Palmer House and Navy Pier. The PR Department also edits the Daily Bulletin, the convention newspaper. Radio and television coverage of the Session is arranged by the Bureau of Health Education.

The scientific activities, which form the major portion of the Annual Session, are planned by several groups. The Council on Scientific Assembly arranges for the general meetings, and each of the sections represented on the Council plans the program for its particular specialty. There are now 20 sections in the Council, including Anesthesiology; Dermatology and Syphilology; Diseases of the Chest; Experimental Medicine and Therapeutics; Gastro-Enterology and Proctology; General Practice; Internal Medicine; Laryngology, Otology and Rhinology; Military Medicine; Nervous and Mental Diseases; Obstetrics and Gynecology; Ophthalmology; Orthopedic Surgery; Pathology and Physiology; Pediatrics; Physical Medicine and Rehabilitation; Preventive and Industrial Medicine and Public Health; Radiology; General and Abdominal Surgery; Urology; and a special section on Miscellaneous Topics to cover other fields. Many of the papers presented are later published in The Journal.

The Scientific Exhibit is prepared under the direction of the Association's Committee on Scientific Exhibit. Each section arranges displays in its field. In addition, the Committee develops several special exhibits for each meeting. In Chicago these will include exhibits on fractures, fresh pathology, and the latest methods of resuscitation, under simulated rescue conditions in the waters of Lake Michigan at the end of Navy Pier. Three exhibit symposiums are planned on overweight, diabetes, and cardiovascular diseases. Question and answer sessions on each of these topics will be held in rooms adjacent to the exhibits.

The motion picture program is planned by A. M. A.'s Committee on Medical Motion Pictures. In Chicago, 22 different films, 3 of which are première presentations, will be shown. Color television is sponsored by Smith, Kline and French laboratories and arranged in cooperation with Chicago physicians.

Planning and staging an A. M. A. meeting is a gigantic cooperative effort. The result was once described to me as "a complete postgraduate education under one roof." This meeting, as well as the Clinical Session, is a service provided by the A. M. A. to its members in line with the Association's purpose "to advance the science and art of medicine."

John W. Cline, M.D., San Francisco.

ORGANIZATION SECTION

RESOLUTIONS TO BE PRESENTED TO HOUSE OF DELEGATES

The Secretary of the Association has been informed that the following resolutions will be submitted to the House of Delegates at the Chicago Session in June by a delegate of the Medical Society of the District of Columbia.

RESOLUTION ON CANDIDATES FOR PUBLIC OFFICE

Whereas, It is the duty of every physician to discharge all the responsibilities of citizenship including those of a political nature; and

Whereas, It is not the function of his professional medical organization to participate in partisan politics; therefore be it

Resolved, By this House of Delegates that The American Medical Association does not support any political party or any candidate for elective public office.

RESOLUTION ON MEDICAL CARE TO VETERANS

Resolved, That The American Medical Association favors action looking toward the reduction of medical care to veterans with nonservice-connected disabilities except where the inability to provide for such service can be demonstrated.

RESOLUTION ON MEDICAL AND HOSPITAL BENEFITS FOR DEPENDENTS OF SERVICE PERSONNEL

Resolved, That legislation to provide medical and hospital benefits for dependents of service personnel at federal expense be opposed by the American Medical Association until need for such legislation is clearly demonstrated.

RESOLUTION ON TRANSFER OF DISABLED VETERANS

Resolved, That the American Medical Association favors the transfer of seriously disabled veterans from service hospitals to Veterans Administration facilities.

RESOLUTION ON REACTIVATION OF COMMITTEE ON MOTOR VEHICLE ACCIDENTS

Whereas, The continuing high mortality and disability due to automobile accidents is cause for great concern;

Whereas, There is need for further efforts to reduce the number of accidents; therefore be it

Resolved, By this House of Delegates that the Committee on Motor Vehicle Accidents of the American Medical Association be reactivated.

THE WORLD MEDICAL ASSOCIATION

The International Labor Organization will hold a conference in Geneva in June, 1952. One of the main topics of discussion will be the minimum standards of social security, including medical care. There will also be some discussion on possible maximum standards. The proposed convention on these standards, if adopted by the conference, will be sent to all member countries of the ILO (of which the United States is one) for ratification. Ratification of such a convention by the United States may seriously affect the status of medical care for patients, as well as the status of the medical profession in this country.

The program envisages the inclusion of (1) 20% of the population; (2) 50% of all employees; or (3) 50% of all residents. The minimum standard requires (1) general practitioner care, (2) specialist care both in and outside of hospitals, (3) essential pharmaceutical supplies, and (4) hospitalization when necessary. There are also provisions for maternity care, including prenatal, confinement, and postnatal care.

Details of the proposed plan will be found in a large document, Report V (a) (2), Minimum Standards of Social Security, issued by the International Labor Office in 1952. It is suggested that physicians obtain this document for their information. At the end of the above document there is appended a "Statement of WHO Consultant Group." This statement was prepared at the request of the ILO by a consultant group of medical experts for the purpose of reviewing the medical provisions of the proposed convention. This consultant group was composed of the following persons: Dr. E. Aujaleu, Directeur de l'Hygiène sociale au Ministère de la Santé publique et de la Population (France); Dr. A. Leslie Banks, professor of human ecology, University of Cambridge (United Kingdom); Dr. C. van den Berg, Director-General for International Health Affairs (Netherlands); Dr. J. Axel Höjer, Director-General of Public Health (Sweden); Dr. René Sand, Professeur honoraire à l'Université libre de Bruxelles (Belgium); Dr. Henry E. Sigerist, research associate, Yale University, United States of America (resident in Switzerland).

It will be noted that not a single member of this group is a practicing physician. The Secretary General of the World Medical Association has written a strong protest to WHO on the appointment of such committees, which disregards an opportunity of the practicing profession to present its viewpoint.

The report issued by the consultant group, and which will reach all delegates to the ILO convention, definitely recommends a full-time salaried medical service. It discusses the fee for service system and ruthlessly discards it, stating that "the system exposes the physician to the temptation to care for a patient who should be sent to a specialist or an institution. It gives an incentive for the prolongation, rather than the reduction of illness." It then discusses the capitation system, which it thinks better than the fee for service system, but discards it as "permitting a perfunctory quality of medical care since the physician receives no more reward for extra service." Finally, it lauds the salary system in an illogical and unfounded manner.

The Council of the WMA, after considering the documents above quoted and the report of its Social Security Committee directed that a statement presenting the views of WMA be sent to the ILO and to all member associations. This statement contains a discussion of the philosophy of social security. It also restates the principles adopted by the Second General Assembly of WMA in 1948, and it evaluates and clarifies those principles.

The council held an interview on April 30, 1952, with Miss Laura Bodmer of ILO, during its meeting at Brussels. Later, on May 7, the president of WMA, Dr. Dag Knutson, the Consultant General, Dr. T. C. Routley, the Liaison Officer, Dr. Jean Maystre, and the Secretary General, Dr. Louis H. Bauer, interviewed the Deputy Director General of ILO and two of his associates, at Geneva. While Mr. Rao, the Deputy Director General, intimated that he would be personally interested in reading the document, it would serve no useful purpose for the WMA representatives to leave it with him, as he could not have it distributed to the delegates. Apparently, the only way it could reach the delegates would be either for the document to be sent to the chairman of the Conference Committee on Social Security (not yet appointed), who might distribute it, or for the World Medical Association to attempt to distribute it. Both methods will be used.

It is very important for all members of the A. M. A. to carefully read the document prepared by the Council of the World Medical Association. It is reproduced below.

The only section in the document that may puzzle American physicians is that pertaining to Principle XI, which reads "Compulsory health insurance plans should cover only those persons who are unable to make their own arrangements for medical care." In the United States physicians do not believe that compulsory plans are necessary for anyone. It must be remembered, however, that many countries do have compulsory plans, but the doctors in all countries that are members of the World Medical Association are in agreement that if such plans do exist they should be limited as expressed in the quoted statement. This does not mean, however, that the physicians endorse the principle of compulsory health insurance.

The document as a whole is an amazing example of how physicians of 43 nations think alike. It is a striking argument that the

A. M. A. was wise in supporting the World Medical Association, which is carrying the torch on an international level for freedom in medical practice, for quality of medical service to patients, and for elimination of political considerations in medicine. American physicians as well as all others of the free world owe much to the World Medical Association for its constructive thinking and action. The works of the association reveals why all members of the A. M. A. have been urged to become individual members of the United States Committee of the World Medical Association and thus render the Association moral and financial support in its undertakings. Membership is $10 per annum, and application can be made directly to the Secretary-General, World Medical Association, 2 East 103rd Street, New York 29.

STATEMENT BY THE COUNCIL OF THE WORLD MEDICAL ASSOCIATION

Social security is a concept of great interest to doctors. Its aims—to make possible the development of healthy and happy human beings—in theory, run parallel, even coincide, with those of the medical profession. This necessitates close relations between promoters of social security and medical men. The development of the notion of health during the first half of this century further stresses the need for cooperation between these two groups. Modern medicine more and more stresses that somatic health cannot be achieved without mental health. Health is a synthesis of mental and physical elements, tending toward a state of balance. The views of doctors have become close to those who have inspired the internationally adopted definition of health as complete mental, physical and social well-being.

There is, however, a strong theoretical element in this definition. Well-being is not equal to the sum of satisfactory mental, physical and social conditions as laid down in official and other documents. Rather it is based on an emotionally founded appreciation of these favourable circumstances. The social component, regardless of any absolute qualities it may possess, may not be felt as satisfactory and so will not contribute to a state of well-being. Decisive here are highly complex mental reactions, determined on the one hand by such factors as environment, character, education and heredity, and on the other by the means through which the social security has been achieved.

This is important. Social security as a product of individual effort and a reward for personal ability will promote mental well-being. More debatable are the psychological effects of such a security based on communal activity and on benefits distributed through official agencies sometimes only remotely connected with the beneficiary. Satisfaction leading to a feeling of well-being under such circumstances is very uncertain. Benefits are only too often mistaken for rights. In countries where systems for advanced social security are in operation, the outcome does not, in fact, seem to promote general happiness, a sense of personal obligation, mental well-being, or therefore, good health.

The average man cannot appraise the relationship between services rendered and equivalent returns, or judge whether he is getting a fair deal. He will tend to disregard the cost, and always suspect that he does not get a return for his money if, through taxation, he pays a lump sum for a number of benefits, each one of which seems to him to be small. If these taxes are high he will be further encouraged to demand more in return, and this, often for political reasons, generally leads to increased returns and to new benefits—at increased cost, increased taxes, and increased or renewed displeasures, all of which endanger mental well-being.

Another point might be made here. Most people are still brought up on old-established principles of ethics and behaviour. One of these is that a man should primarily be responsible for himself and his activities. He finds, however, that his activities are hedged round with restrictions and that many of his former responsibilities are being taken away from him. With them go much of his old freedom and even more of his earnings—and he finds himself burdened with new tasks, this time not for himself but for some remote conception such as the state or the community. Consciously or unconsciously he reacts with displeasure—and again his mental well-being suffers.

The psychological repercussions of modern social security schemes are not altogether satisfactory. They should be studied before new plans are made and further steps taken—or they will get worse. Naturally conditions vary, and the descriptions given of the average man's dilemma are not universally applicable. But they are applicable to those "advanced" countries where efforts to solve the individual's problems by collective measures have had considerable practical consequences, and which are, therefore, held up as examples to others still having a long way to go before they can begin even to think in terms of an advanced social security, or indeed any security at all. Because of this it is imperative that the medical profession's experiences of the functioning of social security schemes should be made known to promoters and administrators of such schemes. They, too, should continuously consult the medical profession before new plans are made or old ones remade, because it is intended that doctors become more and more involved in the determination of liabilities under the systems adopted.

Fundamental for the success of any security system is its psychologically correct structure. It must not allow the individual to forget that his security is primarily a matter for his own efforts. It is unwise for him to be led to believe that the state or community can take over and relieve him of his responsibilities. Any system created without due observance of this will from the very beginning carry within itself its own seeds of destruction. On the one hand it will never really contribute to health equal to well-being—for reasons already given. It will defeat its own ends. On the other hand it will tend to a steady and uncontrollable expansion at equally uncontrollable costs. These serious consequences are already seen in many countries, and they will, with growing over-population and increasing average length of life, become impossible to master. The productive capacity of the country will be so heavily burdened for the benefit of an increasing number of consumers that governments will in the end not be able to stand the cost, unless other equally or even more important fields of activity are neglected. As "social security" in many parts of the world is the political slogan of the day this may well happen—and as a matter of fact does happen.

The extent to which the individual and his country contribute to his welfare and that of his fellow citizens is a problem for each country to solve, but it is always of great importance to the medical profession. Doctors are concerned because of their experience with various schemes that have been proposed and sometimes adopted. As ILO states, there is a growing tendency to set up public services affording complete medical care, preventive or curative, without distinction of the temporary or chronic nature of the contingency or of occupational or general origin of the disease or accident. There is also a tendency to loosen the ties between benefit right and contribution payment, and to create a public service for the citizenry at large, making all care and supplies available at any time and without time limit, subject only to the doctors' judgment.

The WMA considers this to be incompatible with principles which it believes to be fundamental. If the ties between benefit right and contribution payment are loosened, the individual will ignore the cost of the services given. If insurance principles are abandoned for public service schemes, he will tend to lose his sense of responsibility. If social security costs burden the individual with heavy taxes, he will end by asking for compensation in the shape of more benefits, and he will tend to place his security more or less completely in the hands of society, forgetting that this society after all is nothing but himself and his neighbours.

All this complicates matters for the medical profession. It is willing and eager to shoulder its own responsibilities. The success of its work, however, is the result of team-work where the team consists of two members: the doctor and his patient. Much depends on the cooperation of the latter. Restoration to health to a great extent depends on the will of the patient to get well: this must be encouraged. If the will is there, doctors can the more easily heal their patients as well as control the functioning of social security in their own field—both fairly successfully. If it is not, they will probably fail.

The WMA would finally like to point out that everywhere in the field of social security stress should be laid on prevention and rehabilitation. The primary aim must be to create health conditions of living—for example, with regard to housing, nutrition, clothing, recreation and working conditions. The higher a country's development, the less should be the need for official promotion of social security. It might well be asked whether an extensive and costly social security system really is a sign of soundness and advanced development of a country.

The WMA has in this paper so far dealt with some of the consequences of social security which have an indirect influence on the work of doctors. There are more direct ones, the intensity and scope of which are in proportion to the extent to which the medical profession is employed by or tied to the social security organization. As the doctor and his patient form a sort of unit, it is impossible here to make clear distinctions—what has an influence upon the one affects also the other. However as a social security scheme can do anything between two extremes—one leaving the medical profession entirely free, and the other transforming it into a group of whole-time employees—the General Assembly of the WMA, at its meeting in Geneva, 1948, set down the following twelve principles of social security, as expressing the views of the profession on the relationship between itself and social security:

Whenever medical care is provided as part of social security, the following principles should govern its provisions:

I. Freedom of choice of physician by the patient. Liberty of physician to choose patient except in cases of urgency or humanitarianism.

II. No intervention of third party between physician and patient.

III. Where medical service is to be submitted to control, this control should be exercised by physicians.

IV. Freedom of choice of hospital by patient.

V. Freedom of the physician to choose the location and type of his practice.

VI. No restriction of medication or mode of treatment by physician except in case of abuse.

VII. Appropriate representation of medical profession in every official body dealing with medical care.

VIII. It is not in the public interest that physicians should be full-time salaried servants of the government or social security bodies.

IX. Remuneration of medical services ought not to depend directly on the financial condition of the insurance organization.

X. Any social security or insurance plan must be open to the participation of any licensed physician, and no physician should be compelled to participate if he does not wish to do so.

XI. Compulsory health insurance plans should cover only those persons who are unable to make their own arrangements for medical care.

XII. There shall be no exploitation of the physician, the physician's services or the public by any person or organization.

Some of these principles are self-explanatory, others, perhaps less so. The World Medical Association would like to make the following comments thereon, in order to clarify their meaning:

I. Freedom of Choice of Physician by the Patient. Liberty of Physician to Choose Patient Except in Cases of Urgency or Humanitarianism.—Administrative and financial considerations must not be allowed to interfere with the freedom of the patient to choose (and change) his doctor and vice-versa. The intimate personal relationship between physician and patient makes any compulsion harmful, for where there is compulsion, trust and confidence are impaired to the detriment of the patient's welfare.

II. No Intervention of Third Party Between Physician and Patient.—When medical care is provided as part of social security, the state or the local authority or the insurance company enters into relationship with patient and doctor. Such relationship must not involve interference with the essential freedoms of either, and no method of payment of doctor or condition of service should be introduced without prior consultation with and the consent of the medical profession.

III. Where Medical Service Is to Be Submitted to Control, This Control Should Be Exercised by Physician.—The greater the knowledge of what is being controlled the more efficient—and in medicine the more human—will be the control. Nonmedical control of medical service introduces elements of distrust and frustration. The medical profession has never been short of able and devoted doctors, experienced in the practice of medicine, who are prepared to undertake administrative responsibility, and they should hold key positions in the administrative direction of medical services. Medical administrators should be so chosen as to command the fullest confidence of all concerned.

IV. Freedom of Choice of Hospital by the Patient.—This freedom must of course have some topographical and medical limitation. It is directed against compulsory usage by patient and doctor of a hospital simply because of its propinquity.

V. Freedom of the Physician to Choose the Location and Type of His Practice.—Except in time of national emergencies, the medical profession is resolutely opposed to the direction of practicing physicians to certain places or to certain types of work. Such direction is an infringement of the liberty of the subject. Negative direction—that is direction by exclusion, is something which may be against the real medical interests of the community in which it operates.

VI. No Restrictions of Medication or Mode of Treatment by the Physician Except in Case of Abuse.—The freedom of the doctor to prescribe according to his conscience whatever treatment he thinks necessary for his patient is fundamental to the art and science of medicine. Any compulsion on the doctor to prescribe specific forms of treatment would be to impose on him a therapeutic orthodoxy which would hinder the progress of medicine.

VII. Appropriate Representation of Medical Profession in Every Official Body Dealing with Medical Care.—Just as doctors should be in positions of control at every level in the administrative work connected with medical care under social security schemes, so should they be fully represented on the various advisory bodies at every level. The association of the organized medical profession with controlling and advisory bodies will evoke the maximum sense of responsibility in the medical profession to the community it serves and so be in the highest interests of the patients.

VIII. It Is Not in the Public Interest That Physicians Should Be Full-Time Salaried Servants of the Government or Social Security Bodies.—This principle is directed against the practice of personal medicine by full-time salaried doctors against, that is, a full-time salaried state medical service. It is recognized that if the medical profession is to be in a position of control in providing medical care in social security schemes, some full-time salaried administrative posts must be occupied by doctors. It is recognized, too, that some full-time salaried doctors, for example, medical superintendents may have to be appointed in hospitals owned by the state or the municipality. But as human beings, including doctors, are so variously endowed by nature unequal in their mental and physical capacities, any attempt to equalize them by establishing fixed salaries will lend to frustration of spirit, discontent, inefficiency, idleness and an unbalanced state of affairs. As a general rule, to pay by salary carries risks of imposing limitation of effort, and in the case of the physician who provides personal medical care this is against the interests of the patient, in fact, detrimental to him. It is a sound principle to leave each practicing doctor the task of imposing upon himself those limitations of effort which by experience he knows are necessary if he is to give of his best to the patients under his care. Any attempt to restrict hours of work or capacity for earning a reward for work incurs the grave risk of attempting to produce a standard doctor for a standard patient, to put human nature into a strait-jacket.

IX. Remuneration of Medical Services Ought Not to Depend Directly on Financial Condition of the Insurance Organization. —The remuneration of doctors providing medical care in a social security scheme must be related to their status and prestige in the community, to the duration, arduous nature and costs of their education, and to the hazards of an occupation which means constant strain and exposure to such risks as infection.

The cultural and ethical standards of a civilized society depend for their maintenance and promotion principally upon the integrity and examples of the learned professions, of which medicine is one—and one whose influence on society is now greater than at any other time in history. There is a grave danger that social security schemes, however idealistically conceived, will progressively diminish the cohesive moral and cultural force emanating from the corporate life of the learned professions. The fundamental fallacy of the planners of social security schemes is the ignoring of this force, coupled with a tendency to regard practicing doctors merely as technicians employing certain technical skills.

X. Any Social Security or Insurance Plan Must Be Open to the Participation of Any Licensed Physician and No Physician Should Be Compelled to Participate If He Does Not Wish to Do So.—Self explanatory.

XI. Compulsory Health Insurance Plans Should Cover Only Those Persons Who Are Unable to Make Their Own Arrangements for Medical Care.—With the high cost of medical care at a time of rapid expansion of medical science, the medical profession recognizes that in a wide range of physical and mental disorders the individual's capacity to meet the full cost of treatments and of restoration to health is often severely limited. But the greater the degree and range of compulsion the greater will be the loss of personal responsibility. To impose compulsory insurance upon those able to care for themselves is to attack the rights and ideals of minorities in society. The WMA believes that assistance through social security schemes should be given only to those who need it. Those who do not need it should make provision for themselves either through thrift or through voluntary insurance.

XII. There Shall Be No Exploitation of the Physician, the Physician's Services or the Public by Any Person or Organization.—Self explanatory.

CONCLUSION

All schemes of social security more or less restrict the liberty of the individual. Such restrictions are and must be accepted by persons living in a community, as a form of self-government. Doctors are interested in and welcome plans for medical care which enable them to look after their patients more efficiently.

Doctors are, however, perturbed by possible unfavourable effects of social security schemes on individual men and women. While they recognize that society has an obligation to help those who through nature, nurture, accident, disease and environment are handicapped in the struggle to survive, they fear the demoralizing effects of state paternalism exercised on adults.

A powerful factor in recovery from illness and in restoration to health is the sense of personal responsibility of the patient for what happens to him. This is something indispensable in the doctor-patient relationship. In what is called the Welfare State social security schemes loom large, and in these schemes the provision of (apparently) free medical services is important. The more the State does for the individual in this direction, the less is the individual sense of obligation and responsibility.

Apart from these psychological considerations, financial implications of social security schemes cannot be without concern to doctors. For example, the demand of patients for drugs leads to a disproportionate expenditure on ineffective remedies. This diverts money from what may be more important medical services, because expenditure on medical services of all sorts cannot be unlimited—except in Utopia.

Modern medical thinking stresses the balance of mental and physical factors in the health and well-being of the individual. Any social security scheme which stresses one factor and neglects the other will disturb this balance to the disadvantage of the individual.

Therefore, it is recommended that:

1. When social security schemes are necessary, they should be developed in the closest collaboration with the medical profession. Such schemes should take into account the psychological effect on the beneficiaries of increased dependency and diminished responsibility. Therefore,

2. The fundamental aim of a social security scheme should be to raise the individual to a level at which he can help himself. From this, it follows that:

3. Any social security scheme should contain elements that encourage self-reliance and a sense of personal responsibility, and that:

4. Any social security scheme should stress the obligation of the individual to make at least part of his contribution directly to the functioning and costs of the scheme.

ADDENDUM

The following resolution has been presented by the reference committee on miscellaneous business of the House of Delegates of the Medical Society of the State of New York.

WHEREAS, in June, 1952, the International Labor Organization will hold an international meeting composed of representatives of government, management and labor; and

WHEREAS, at this meeting there will be considered the subject of "Minimum Standards of Social Security" which will include the subject of medical care; and

WHEREAS, the International Labor Organization has made no attempt to obtain the opinions of the practicing medical profession; and

WHEREAS, the World Health Organization at the request of the International Labor Organization appointed an Expert Committee on Medical Care in Social Security; and

WHEREAS, that is the only report from any section of the medical profession which will be submitted to the delegates at the International Labor Organization meeting; and

WHEREAS, there was not a single practicing physician on this committee; and

WHEREAS, that report of the World Health Organization Expert Committee recommends a full-time salaried medical service; therefore, be it

Resolved, that the House of Delegates of the Medical Society of the State of New York urge its members to make contact with their senators, voicing disapproval of that section of the "Minimum Standards of Social Security," pertaining to the subject of Medical Care, as proposed by the International Labor Organization and in particular the report of the World Health Organization Expert Committee on Medical Care, which advocates a full-time salaried medical service; and be it further

Resolved, that the Medical Society of the State of New York, at its annual convention in New York, May 12-14, 1952, disapproves of these reports and memorializes the senators of this State to obtain and consider the opinions of the practicing profession in connection with any plan for medical care; and be it further

Resolved, that the delegates from the Medical Society of the State of New York be and hereby are instructed to introduce a similar resolution in the House of Delegates of the American Medical Association with the request that its membership communicate with their senators in regard to the resolution of the International Labor Organization, which pertains to medical care.

A. M. A. COUNCILS AND BUREAUS AVAILABLE FOR CONSULTATION AT CONVENTION

During the period June 9 to June 12 inclusive, representatives of the staffs of the various Councils and Bureaus of the Association will be available for consultation in the Exhibit Hall, South Pier, Booth C 149. The following schedule has been arranged:

Council on Industrial Health	9-10 a. m.
Council on Rural Health	9-10 a. m.
Bureau of Medical Economic Research	10-11 a. m.
Council on National Emergency Medical Service and Committee on Legislation	11 a. m.-12 noon
Bureau of Health Education	11 a. m.-12 noon
Council on Medical Service	1-2 p. m.
Washington Office	1-2 p. m.
Public Relations Department	2-3 p. m.
Membership and Records Department	2-3 p. m.

In addition, some of the Bureaus and Councils will have booths, in the vicinity of Booth C 149, where attendants will be available during the entire period.

MEDICAL NEWS

ARKANSAS

Hospital to Treat Arthritics Only.—The Leo N. Levi Memorial Hospital, Hot Springs, beginning Sept. 1, will be devoted entirely to treatment and research in the field of arthritis. This national hospital, which is dedicated to the free treatment of arthritics regardless of race or creed, hitherto also was utilized, since its founding by B'nai B'rith in 1914, as a general and emergency hospital for the Hot Springs area.

Personals.—Dr. James S. Taylor, colonel, U. S. Army, retired, has become chief of the medical staff of the Arkansas State Hospital for Nervous Diseases, Little Rock. He served as chief cardiologist for the army for the last five years at Walter Reed General Hospital, Washington, D. C.——Dr. William A. Reilly, head of the department of pediatrics at the University of Arkansas School of Medicine, Little Rock, has resigned to accept a position as chief of the radioisotope laboratory of the Veterans Administration Hospital at San Francisco.

CALIFORNIA

Society News.—At the annual session of the California Society of Allergy in Los Angeles, April 27-30, Dr. M. Coleman Harris of Vallejo was elected president; Dr. Grace M. Talbott of San Francisco, president-elect; and Dr. Norman M. Shure of Los Angeles, secretary-treasurer.

Narcotic Violation.—Dr. Andrew Salm, 12300 Stanwood Dr., Los Angeles, was convicted of violation of federal narcotic laws in the United States District Court for the Southern District of California at Los Angeles. On March 31 Dr. Salm was sentenced to two years. His sentence was suspended, and he was placed on probation for two years.

Hematology Research Funds Available.—The Commission of the Irwin Memorial Blood Bank of the San Francisco Medical Society announces that the blood bank has limited funds available for research in the field of immunohematology and transfusion therapy. Physicians desiring information on grants should contact Dr. Curtis E. Smith, chairman of the research committee for the Irwin Memorial Blood Bank of the San Francisco Medical Society.

CONNECTICUT

Nominated for the Bernard Foundation Prize.—Prof. Charles-Edward Amory Winslow of New Haven, professor emeritus of public health, Yale University, has been nominated by the World Health Organization for the Léon Bernard Foundation prize, established by international subscription in memory of Prof. Léon Bernard of France, a member of the health committee of the League of Nations. The prize, given for practical achievement in social medicine, consists of a medal and 1,000 Swiss francs (about $230).

GEORGIA

State Medical Meeting.—At the annual meeting of the Medical Association of Georgia in Atlanta, May 11-14, under the presidency of Dr. William Farrell Reavis, Dr. R. B. Robins, president of the American Academy of General Practice, Camden, Ark., spoke on "Medicine in This Changing World." Other out-of-state speakers were Drs. David M. Davis, Barton R. Young, and Edward Weiss, Philadelphia; John W. Cline, San Francisco, President of the American Medical Association; Willis J. Potts, Chicago; James T. Priestley, Rochester, Minn.; Robert A. Ross, Durham, N. C.; H. Earle Conwell, Birmingham, Ala.; William L. Wilson, Washington, and Ralph R. Thompsett, New York.

ILLINOIS

Teaching Prospective Mothers and Fathers.—According to a report by Drs. James B. Gillespie and Thomas R. Wilson of Urbana before the annual meeting of the Illinois State Medical Society, the program for teaching mothers how to care for themselves and their babies is working out well in Champaign and Urbana. The instruction, during the last few weeks of pregnancy, is given in a series of three classes to which the father is also invited. The first class is devoted to obstetrics, and the second and third to pediatrics. In each the physiology, anatomy, and development of the child, the errors to be avoided, and other details are explained. In four years the attendance at such conferences was 3,768, some patients driving as far as 50 miles to attend. After the baby is born the class work is followed up by a nurse who visits the home and gives further instruction.

Chicago

Dr. Rusk to Address Welfare Meeting.—Dr. Howard A. Rusk, chairman, department of physical medicine and rehabilitation, New York Hospital-Bellevue Medical Center, will address the annual meeting of the Health Division of the Welfare Council of Metropolitan Chicago June 9 at noon at the Standard Club.

Society News.—At the annual meeting of the Chicago Ophthalmological Society, April 17, Dr. William F. Hughes Jr. was elected president; Dr. Kenneth L. Roper, vice-president; Dr. Gail R. Soper, secretary-treasurer; Dr. Frank W. Newell, councilor; and Dr. Richard C. Gamble, corresponding secretary.

Solomon Memorial Fund.—The Dr. Jerome D. Solomon Memorial Research Foundation has started a $200,000 fund campaign to continue through November. The foundation, which supports fellows doing research at the Hektoen Institute for Medical Research of the Cook County Hospital, was organized seven years ago in memory of Dr. Solomon, who while serving as a captain in the Army Medical Corps, died in 1944 in Sansapor, Dutch New Guinea.

Scholarship Fund for Medical Librarians.—The Chicago and Vicinity Association of Medical Record Librarians has established the Fae Dillman Memorial Scholarship Fund in honor of the late Mrs. Fae Dillman, who was an assistant medical record librarian at the University of Illinois at the time of her death in April, 1950. Under the provisions of the fund, loans up to $300 per person will be made to students who attend accredited schools for medical record librarians in Chicago. These schools are located at Grant Hospital and at Wesley Memorial Hospital.

INDIANA

University News.—At the annual Alumni Day program at the Indiana University School of Medicine held May 14 under the presidency of Dr. William C. Moore, Muncie, Dr. Dwight H. Murray (class of 1917) Napa, Calif., chairman of the Board of Trustees of the American Medical Association, spoke on "The American Medical Association and the Medical Schools." Dr. Dillon D. Geiger, Bloomington, was installed as president of the Alumni Association for the coming year.——Twenty-two research projects covering a variety of investigations on the medical center campus of the Indiana University School of Medicine, Indianapolis, are now being financed in whole or in part by funds from the James Whitcomb Riley Memorial Association. ——Rolla N. Harger, Ph.D., chairman, department of biochemistry and pharmacology, recently gave a series of four talks on "Alcohol and Safety" at regional meetings of the Shell Oil Company employees in Huntington and Vincennes and in Louisville, Ky.——Dr. W. Foster Montgomery of the department of surgery was a guest lecturer at the International Surgical Seminar on Pediatric Surgery in Madrid, Spain. His lecture was on "Meconium Ileus."

Physicians are invited to send to this department items of news of general interest, for example, those relating to society activities, new hospitals, education and public health. Programs should be received at least three weeks before the date of meeting.

IOWA

Woman of the Year.—Dr. Nelle S. Noble, Des Moines, past president of the American Medical Women's Association, was recently selected by the women's department of the Des Moines Chamber of Commerce as "Woman of the Year." The selection was made on the basis of Dr. Noble's service to the community. Dr. Noble retired in 1949 after practicing for 44 years as a general practitioner. Among her projects were assistance to poor and underprivileged families in Des Moines and nursing homes for sick and elderly persons.

MARYLAND

Blood Center Needs Personnel.—The Baltimore Defense Blood Center of the American National Red Cross, St. Paul and 23rd St., Baltimore 18, announces that it is necessary to increase the medical staff. The salary is $6,600 a year, and the hours are from 9 a. m. to 5 p. m. Monday through Friday. Physicians interested may contact Dr. Courtney W. Shropshire, Medical Director, Baltimore Defense Blood Center, Hopkins 9905.

Personals.—Dr. David Bodian, Baltimore, delivered the annual Don W. Gudakunst Memorial Lecture at the School of Public Health, University of Michigan, May 13 on "The Pathogenesis of Poliomyelitis."——Curt P. Richter, Ph.D., associate professor of psychobiology, Johns Hopkins University School of Medicine, Baltimore, delivered the Menas S. Gregory Lecture on "Stress and Structural Change" May 1 in the Amphitheater, Psychiatric Division, Bellevue Hospital, New York.

MICHIGAN

New Medical Science Building.—The cornerstone for Wayne University's new $4,000,000 medical science building, first unit of a proposed medical center in Detroit, was laid May 9. The "T" shaped structure, with 140,000 sq. ft. of floor space for teaching laboratories, offices and research facilities, will enable Wayne to increase its medical school enrollment by 50%. University officials estimate the building will be ready for use by the freshman class in 1953.

Award of the Howard Ricketts Medal.—Dr. Thomas Francis Jr., chairman of the department of epidemiology, School of Public Health, University of Michigan, Ann Arbor, and director of the U. S. Army Influenza Commission, has been awarded the Howard Ricketts Medal of the University of Chicago. The presentation was made at a University of Chicago scientific meeting in Billings Hospital May 12. Dr. Francis spoke on "The Significance of Variation Among Influenza Viruses" and later was guest of honor at a dinner of the university's division of biological sciences at the Quadrangle Club.

MISSOURI

Narcotic Violation.—Dr. Cecelia King McGill, 305 N. 6th St., St. Joseph, pleaded guilty to an indictment charging violation of U. S. C. Title 26, Section 2554, in the United States District Court at St. Joseph, and on March 17 was sentenced to serve a term of three years.

Dr. E. E. Nelson Joins St. Louis Faculty.—Dr. Erwin Ellis Nelson, medical director and chief of the division of medicine, U. S. Food and Drug Administration, has accepted a position as head of the department of pharmacology at St. Louis University School of Medicine, succeeding Dr. Robert H. K. Foster, who is leaving the university to enter the private practice of medicine.

Dr. Nelson, on leave from the University of Michigan, organized the division of pharmacology in the Food and Drug Administration in 1935. He has been affiliated with the faculties of numerous institutions, including Southern Collegiate Institute, Albion, Ill.; University of Missouri, Columbia; University of Michigan Medical School, Ann Arbor; and Tulane University of Louisiana School of Medicine, New Orleans. He was director of the Wellcome Research Laboratories, Tuckahoe, N. Y., from 1943 to 1947, and from 1947 to the time of his present appointment served in the Food and Drug Administration.

NEBRASKA

Fifty Years in Practice.—During its recent annual session, the Nebraska State Medical Association awarded pins commemorating 50 years of medical practice to the following physicians: Drs. Walter L. Albin of Lincoln, Louis C. Bleick, Daniel T. Quigley, and Philip Sher of Omaha, and John D. Reid of Pilger.

Camp for Diabetic Children.—Springdale Camp, a nonprofit community project to help diabetic children, will be opened June 8-21. The charge is $50 for the two weeks, but funds are available to cover the expenses of children who are unable to pay. This camp was organized and is directed by Nebraska physicians, largely through the diabetic committee of the Nebraska State Medical Association. For information write to Miss Anna Smrha, Department of Health, State Capitol, Lincoln.

NEW JERSEY

Dr. E. C. Kendall Awarded Medal.—At the recent meeting of the Association of American Physicians in Atlantic City, Georgetown University awarded the Kober Medal for 1952 to Edward C. Kendall, Ph.D., co-discoverer of cortisone. Dr. Kendall, of the chemistry department at Princeton University and formerly head of the division of biochemistry at the Mayo Clinic, was a Nobel prize recipient in 1950.

NEW YORK

Meeting of School Physicians.—The annual meeting of the State Association of School Physicians and the State School Nurse-Teachers Association will be held at Lake Placid June 2-3. Dr. Edith G. Mead, Poughkeepsie, is president of the State Association of School Physicians. Dr. George M. Wheatley, of the Metropolitan Life Insurance Company, New York, will speak on "Observations on School Health." The evening program at 8 p. m. will be as follows:

School Cardiac Problems, J. G. Fred Hiss, Syracuse.
Problems of Adolescence, J. Roswell Gallagher, Boston.
Cancer in Childhood, Theodore J. Curphey, Hempstead.

Annual Health Conference at Lake Placid.—The annual health conference of the New York State Department of Health will be held at Lake Placid June 3-6. Dr. Herman E. Hilleboe, state health commissioner, will preside at the opening session. Among the speakers will be Dr. Edward T. Wentworth, president-elect of the Medical Society of the State of New York, and Dr. Gaylord W. Anderson, dean, School of Public Health, University of Minnesota, Minneapolis, and president of the American Public Health Association. Physicians discussing "Child Health," the topic for the second general session, will include Drs. Leona Baumgartner, New York, Harold C. Stuart, Boston, and Mitchell I. Rubin, Buffalo. A discussion on "Chronic Disease" will include Drs. Cassius Van Slyke, Bethesda, Md., Edward M. Holmes Jr., Richmond, Va., and Martin Cherkasky and Donald A. Covalt, New York. The afternoon session will comprise a discussion of vital statistics in public health. Participating in this discussion will be A. Bradford Hill, Ph.D., head of the department of medical statistics, London School of Hygiene and Tropical Medicine, in England, and Dr. Joseph Berkson of the Mayo Clinic, Rochester, Minn. There will be a symposium on the isonicotinic acid derivatives in tuberculosis.

New York City

Gift to Heart Association.—A contribution of $2,500 from the American Trust Company of New York City to initiate a fund to send research investigators of the American Heart Association to the Fourth Inter-American Cardiological Congress at Buenos Aires has been announced by Dr. Irving S. Wright, president of the association. The congress will be held Sept. 1-6 under the auspices of the Argentine Society of Cardiology.

Personals.—Dr. Edward E. Gordon has been named director of medical services at the Institute for the Crippled and Disabled and associate professor of rehabilitation medicine at the Columbia University College of Physicians and Surgeons.——The first award of the New York Academy of Medicine Plaque was made to Dr. Orrin Sage Wightman in recognition of extraordinary service rendered to the academy over a period of many years.

Agencies Unite to Help Disabled.—Columbia University, Presbyterian Hospital, and the Institute for the Crippled and Disabled have undertaken a program of medical care, physical and social readjustment, and job placement of the handicapped, in which resources and facilities of the three groups will be integrated. A department of physical medicine and rehabilitation has been established at Columbia and an independent physical medicine and rehabilitation service at Presbyterian Hospital for the furtherance of this project. The aims of the affiliation are to strengthen the rehabilitation and reeducation programs of the hospital and institute; to give the university divisions opportunities for the study and improvement of methods of rehabilitation; to provide a joint research and instructional program in rehabilitation; to effect a joint program providing all professional services in proper continuity, and to provide for reciprocal interchange of facilities and services.

Vienna Honors Dr. Pick.—At the celebration of his 80th birthday, May 19, the Honorary Doctorate of Medicine was conferred on Dr. Ernest Peter Pick, pioneer researcher in cell chemistry and biology, by the University of Vienna. The American Society of European Chemists, the Medical Circle, and the Rudolf Virchow Medical Society united to honor Dr. Pick on this occasion. Addresses were delivered by Dr. Otto Loewi, Nobel prize winner in chemistry, and Dr. Hans Molitor of Merck Institute. Many former pupils joined with representatives of local and foreign universities to honor Dr. Pick.

OHIO

New Medical Director for Union Health Center.—Dr. John P. Eichhorn, Cleveland, has been appointed the first medical director of the health center of the International Ladies Garment Workers Union in Cleveland. Approximately 5,000 union members employed by contributing firms will receive annual health examinations, including all necessary laboratory work. If further study is needed, patients will be sent to whatever specialists are indicated. Those specialties provided by the health center staff include electrocardiology, allergy, chest medicine, chest surgery, neuropsychiatry, dermatology, ear-nose-throat, general surgery, genitourinary surgery, proctology, gynecology, neurosurgery, ophthalmology, orthopedic surgery, plastic surgery, and dentistry.

OKLAHOMA

Annual State Meeting.—The Oklahoma State Medical Association held its annual meeting May 19-21 in Oklahoma City under the presidency of Dr. L. Chester McHenry. Out-of-state speakers included:

Howard Ulfelder, Boston, Carcinoma of the Cervix.
Charles L. Martin, Dallas, Carcinoma of the Cervix.
Ormond S. Culp, Rochester, Minn., Variations of the Cherney Incision for Improved Exposure of the Lower Abdomen and Urinary Tract.
Lawrence S. Fallis, Detroit, Billroth I. Gastrectomy.
Wallace E. Herrell, Rochester, Minn., Current Trends in Antibiotic Therapy.
J. Edward Berk, Philadelphia, Management of Acute Pancreatitis.
Walter A. Fansler, Minneapolis, Operative Procedures for Carcinoma of the Rectum and Rectosigmoid.
John R. Haserick, Cleveland, Atypical Systemic Lupus Erythematosus.
H. Harland Crank, Houston, Texas, The Psychological Preparation of Patients for Various Medical, Surgical, and Psychiatric Procedures.
J. Mathews Robison, Houston, Texas, Otitis Media with Effusion.
Bruce Chown, Winnipeg, Canada, Clinical and Pathological Observations on Erythroblastosis.

OREGON

Dr. Richardson Goes to New York.—Dr. Howard L. Richardson, assistant professor of pathology, University of Oregon Medical School, Portland, has accepted the position of associate professor of pathology in preventive medicine in the Sloan-Kettering Division of the Cornell University Medical College, New York. Dr. Richardson, who will be director of the cytology laboratory of the Strang Cancer Prevention Clinic, will work in cooperation with Dr. Cornelius P. Rhoads, director of the Memorial Center for Cancer and Allied Diseases, New York.

PENNSYLVANIA

Society News.—Dr. Louis H. Clerf, professor of laryngology and bronchoesophagology, Jefferson Medical College, Philadelphia, recently lectured on "Laryngeal Lesions of Epithelial Origin" before the Reading Eye, Ear, Nose, and Throat Society.

Sharp Decline in Syphilis.—Dr. Norman R. Ingraham of Philadelphia, chairman of the Commission on Control of Syphilis and Venereal Diseases of the Medical Society of the State of Pennsylvania, reports an 85% reduction in the number of cases of infectious syphilis in Pennsylvania, from 4,368 in 1947 to 648 last year. Cases of all types of syphilis reported last year were the lowest in the past 10 years. Syphilis in the newborn showed a reduction from 860 cases in 1941 to 287 last year. "The relatively sharp decline in infectious syphilis indicates an absolute decline of the incidence of syphilis in the general population of the Commonwealth," Dr. Ingraham declared.

Philadelphia

Bequest to Woman's Medical College.—Under the will of the late Dr. Sara J. Ware of the class of 1890, the Woman's Medical College of Pennsylvania is beneficiary of $15,000. The sum of $7,500 is to be used for the support and maintenance of the college in memory of Dr. Ware's brother, George Melville Williams.

Lectures on Medieval Science.—George Sarton, Sc.D., emeritus professor of the history of science at Harvard University, who was recently appointed the A. S. W. Rosenbach Fellow in Bibliography at the University of Pennsylvania, will deliver a series of three lectures on "Appreciation of Ancient and Medieval Science in the Renaissance." The first lecture, October 17, will be devoted to medicine.

SOUTH CAROLINA

Short Course in Electrocardiography.—The Greenville General Hospital will hold a course on electrocardiography June 13-14. The lectures and demonstrations will be conducted by Dr. J. Willis Hurst of the department of cardiology at Emory University School of Medicine, Atlanta. A fee of $10 will be charged.

TEXAS

State Medical Election.—At the annual meeting of the Texas Medical Association in Dallas May 4-7, Dr. Truman C. Terrell of Fort Worth was elected president; Dr. George Turner of El Paso, president-elect; and Dr. Wayne V. Ramsey of Abilene, vice-president. Drs. Samuel N. Key of Austin and Thomas H. Thomason of Fort Worth continue in office as secretary and treasurer, respectively.

VERMONT

Annual Lecture in Memory of Dr. Hamilton.—The American Psychopathological Association is establishing an annual memorial lecture in honor of the late Dr. Samuel Warren Hamilton, Burlington, Vt., to be known as the Samuel W. Hamilton Memorial Lecture Award. Contributions to the fund should be mailed to Dr. William B. Terhune at New Canaan, Conn., chairman of the fund-raising committee.

VIRGINIA

University Retirements.—William Parker Anslow, Ph.D., associate professor of physiology at New York University College of Medicine, has been appointed professor of physiology and chairman of the School of Physiology of the University of Virginia Department of Medicine, Charlottesville. He will succeed Dr. Sydney W. Britton who will retire in June.——Dr. William Edward Bray, professor of clinical pathology and director of the clinical laboratories, University of Virginia Department of Medicine, Charlottesville, will retire in July. Dr. Bray, founder of the clinical laboratories and of a school for medical technologists at the University of Virginia, and author of "Clinical Laboratory Methods," has served the department of medicine for 39 years.

GENERAL

New Headquarters for Academy of Pediatrics.—The central office of the American Academy of Pediatrics has been moved to 610 Church St., Evanston, Ill. The new offices, half a block from the old headquarters, provide more space and better facilities to meet the growing needs of the academy.

Historians Elect Officers.—At its annual meeting in Kansas City, Kan., May 1-3, the American Association of the History of Medicine elected Dr. John F. Fulton, New Haven, Conn., president; Dr. George W. Corner, Baltimore, vice-president; Dr. Samuel X. Radbill, Philadelphia, secretary; and Dr. Emerson C. Kelly, Albany, treasurer.

Meeting on Civil Defense.—At a program on civil defense June 16 at the Biennial Nursing Convention in Convention Hall, Atlantic City, Dr. Norvin C. Kiefer, Washington, D. C., director of the Federal Health and Special Weapons Defense Division, and Mrs. Frances C. Nabbe, R.N., consultant, Nursing Health and Special Weapons Defense Division, will discuss "Plans of the Health and Special Weapons Defense Division of the Federal Civil Defense Administration."

Annual Bronchoesophageal Meeting.—The American Broncho-Esophagological Association held its annual meeting May 20-21 at the Royal York Hotel, Toronto, Canada, under the presidency of Dr. Herman J. Moersch, Rochester, Minn. Invited speakers included: Drs. G. Arnold Henry, Toronto, Canada; Walter F. Lever, Boston; James H. Walker and Herbert J. Dietrich Jr., Brookline, Mass.; Victor Parchet, Basel, Switzerland, and Alexander H. Beaton, Rochester, N. Y.

Home Study Courses.—The 1952-1953 Home Study Courses in the basic sciences related to ophthalmology and otolaryngology, offered as part of the educational program of the American Academy of Ophthalmology and Otolaryngology, will begin on Sept. 1 and continue for 10 months. Information can be secured from Dr. William L. Benedict, executive secretary-treasurer of the academy, 100 First Avenue Building, Rochester, Minn. Registrations should be completed before Aug. 15.

Dr. Lawrence to Retire September 1.—Dr. Joseph S. Lawrence, director of the A. M. A. Washington Office since 1944, will retire Sept. 1. His successor will be the present Deputy Director, Dr. Frank E. Wilson. Many of Dr. Lawrence's friends are planning a subscription luncheon for him on Sunday, June 8, in Chicago, the day before the annual meeting of the American Medical Association opens officially. Anyone desiring reservations for the luncheon may contact the office of the Secretary and General Manager, Dr. George F. Lull, 535 N. Dearborn St., Chicago.

Medicinal Chemistry Symposium.—The Third National Medicinal Chemistry Symposium will be sponsored by the American Chemical Society's Division of Medicinal Chemistry at the University of Virginia June 12-14. Recent progress in the chemical study of hardening of the arteries, new observations on the influenza virus, and the latest developments in the chemistry of cortisone and corticotropin will be discussed. "The Mechanism of Drug Action" is the subject of a roundtable discussion on Thursday evening, with Dr. Arthur P. Richardson of Emory University, Atlanta, as moderator. Leon A. Sweet, Ph.D., of Detroit, director of chemical research and products development of Parke, Davis & Company, will speak on "The Roles of Industry, Universities and Government in Medical Research" at a dinner Friday night.

American Urological Association.—The American Urological Association will hold its annual meeting at the Chalfonte-Haddon Hall in Atlantic City, N. J., June 23-26 under the presidency of Dr. Elmer Hess of Erie, Pa. Twenty-two motion pictures will be shown, and 31 papers will be presented. The papers will include prize-winning essays read by invitation by Drs. Milton L. Rosenberg, San Francisco (first prize); Robert A. Kelley, Charlottesville, Va. (second prize); Johan N. deKlerk, Baltimore (third prize); and Alex L. Finkle, New York (honorable mention). On Wednesday afternoon, following the presidential address on "What of the Future?" the Ramon Guiteras Lecture, "Endocrine Factors in Cancer," will be presented by Dr. Charles B. Huggins, professor of urology and director of the Ben May Laboratory for Cancer Research, University of Chicago. The banquet at 8 p. m. that evening will be preceded by the president's cocktail party at 6:45.

On Thursday morning Dr. Charles C. Higgins, Cleveland, will serve as moderator for a panel discussion on "Carcinoma of the Bladder." Collaborators will be Drs. Hugh J. Jewett, Baltimore, William A. Milner, Albany, Fathollah K. Mostofi, Washington, D. C., and Vincent J. O'Conor, Chicago.

The seventh annual award for research on the male reproductive tract will be presented Thursday afternoon to Warren O. Nelson, Ph.D., professor of anatomy, State University of Iowa College of Medicine, Iowa City. Dr. Nelson will speak on "Problems of Testicular Function."

American Medical Women's Association.—The American Medical Women's Association will hold its annual meeting June 7-9 with headquarters at the Blackstone Hotel, Chicago. There will be two banquets, the first on Sunday at 7 p. m. when the Woolley Memorial Lecture will be given by Dr. Evelyn M. Anderson of Washington, D. C., on "The Brain Is the Regulator of Metabolism." On Monday Dr. Evangeline E. Stenhouse of Chicago, who will be installed as president at the inaugural banquet, will speak on "Women: Patients and Physicians." A social program extending beyond the convention dates will include a boat trip Monday afternoon, a tour of Armour Laboratories Tuesday afternoon, and luncheon in the garden at the Chicago Art Institute, 12:30 p. m. Wednesday, with a tour through the institute. Luncheon charge is $2.50. Reservations are requested for the social events. On Thursday from 10 a. m. to 5 p. m. there will be open house at Dr. Margaret Austin's cardiac kitchen at the Women and Children's Hospital. During the A. M. A. convention a lounge will be available for the use of all medical women at the Navy Pier where the exhibits and general meetings will be held. This lounge is located on the third floor of the University of Illinois section.

Genitourinary Surgeons Convene.—The American Association of Genito-Urinary Surgeons will hold its annual meeting June 19-21 at the Seaview Country Club, Absecon, N. J., under the presidency of Dr. Charles C. Higgins of Cleveland. On Thursday morning the following symposium on pyelograms will be presented:

Unusual Pyelograms in Adults, Gershom J. Thompson, Rochester, Minn.
Ureterograms, Thomas D. Moore, Memphis.
Urograms in Children, Edgar Burns, New Orleans.
Pyelograms of Renal Displacement, William J. Engel, Cleveland.
Bladder Cystograms, Austin I. Dodson, Richmond, Va.

A symposium on the adrenal glands will be held Friday morning. Presentations will be as follows:

Bilateral Adrenalectomy for Carcinoma of the Prostate, William J. Baker, Chicago.
Further Observations of Bilateral Total Adrenalectomy in Man, J. Hartwell Harrison, George W. Thorn, and H. Dalton Jenkins, Boston.
Adrenalectomy for Tumors of the Adrenal Gland, George F. Cahill, New York.
Surgery of the Adrenal Gland for Cushing's Syndrome, Charles C. Higgins and Eugene F. Poutasse, Cleveland.
The Endocrine Management of Disseminated Prostatic Cancer, Including Bilateral Adrenalectomy and Hypophysectomy, William Wallace Scott, Baltimore.
Pre- and Post-Operative Care of Patient Undergoing Adrenalectomy, Joseph W. Jailer, New York.
Experiences with Bilateral Adrenalectomy and Cortisone Therapy in the Treatment of Advanced Cancer of the Prostate, Wyland F. Leadbetter, Emil J. Ganem, and David H. Solomon, Boston.

Society Elections.—At the annual meeting of the American Dermatological Association in Colorado Springs, Colo., April 23-26, Dr. Earl D. Osborne of Buffalo was elected president; Dr. Paul E. Bechet of Elizabeth, N. J., vice-president; and Dr. Frank C. Combes of New York, treasurer. Dr. Louis A. Brunsting of Rochester, Minn., was reelected secretary.——At the annual business meeting of the American Psychosomatic Society in Chicago, March 29, Dr. Sydney G. Margolin of New York was elected president, Dr. George L. Engel of Rochester, N. Y., president-elect, and Dr. Fredrick C. Redlich of New Haven, Conn., secretary-treasurer.——At the annual meeting of the American College of Physicians in Cleveland, April 21-25, Dr. T. Grier Miller of Philadelphia was inducted as president and Dr. LeRoy H. Sloan of Chicago, professor of medicine at the University of Illinois College of Medicine, was chosen president-elect.——At the annual meeting of the southeastern section of the American Urological Association April 5, Dr. William R. Miner of Covington, Ky., was installed as president. Dr. Russell B. Carson of Fort Lauderdale, Fla., was named president-elect, and Dr. Sidney Smith of Raleigh, N. C., secretary-treasurer. The next meeting of the southeastern section will be held at the Hotel de Nacional, Havana, Cuba, March 26-29, 1953.——At its annual meeting at Old Point Comfort, Va., May 5-7, the Society for Pediatric Research elected Dr. Robert Ward, New York, president; Dr. Milton Rapoport, Philadelphia, vice-president; and Dr. Sydney S. Gellis, Boston, secretary-treasurer.

Nursing Profession Plans to Reorganize.—The nursing profession expects to have a new national organizational structure before next fall. Instead of the six national organizations that are now concerned with professional nursing, there probably will be only two—the American Nurses' Association and the National League for Nursing.

The first definite step in planning for reorganization was taken in 1944, when the boards of directors of the American Nurses' Association, the National League of Nursing Education, and the National Organization for Public Health Nursing voted to undertake a joint survey of their "organization structure, administration, functions, and facilities to determine whether a more effective means can be found to promote and carry forward the strongest possible program for professional nursing and nurses."

During 1945, the Association of Collegiate Schools of Nursing, the American Association of Industrial Nurses, and the National Association of Colored Graduate Nurses joined in the reorganization study. In 1950, the six participating groups voted to realine into two organizations. They asked national committees to work out the details of a plan so that it would be ready for action by the members during the summer of 1952. It was understood that one of the organizations would be the American Nurses' Association and that it would continue to be an all-professional nurse organization exclusively for professional nurses. The other was to be a new organization for all those interested in improving nursing services and education—nurses and non-nurses alike. In the new two organization plan, the American Nurses' Association will promote the professional, general, and economic welfare of professional nurses and help them become the best possible practitioners as individuals and as members of a profession.

"National League for Nursing" is the name being proposed for the new national nursing organization. When the members take necessary action, it will replace and carry forward the major programs of four of the present groups: the American Association of Industrial Nurses, the Association of Collegiate Schools of Nursing, the National League of Nursing Education, and the National Organization for Public Health Nursing. In addition, the National League for Nursing will assume responsibility for activities in nursing never before fully developed.

Both the American Nurses' Association and the National League for Nursing will have state and local or district units. The American Nurses' Association will continue to be a federation of state nurses' associations. Most of these state associations are divided into districts so that members may carry forward a well developed and direct program in addition to state and national programs.

The National League for Nursing, too, will have constituent units in the states, and a State League for Nursing will have district units. It is intended that, when the members take necessary action, a State League for Nursing will take the place of any and all of the following groups that may now be organized in a state: State League of Nursing Education, State Organization for Public Health Nursing, State Association of Industrial Nurses, and a State Committee on the Improvement of Nursing Services (The Association of Collegiate Schools of Nursing does not have state units).

Realinement of the national nursing organizations will make it possible for nursing to achieve close coordination of effort and at the same time preserve the diversity that stimulates the growth of various phases of nursing. Through a two organization structure, nurses, members of allied professional groups, and other citizens will be able to work together more effectively toward a common goal—better nursing care for the public.

FOREIGN

German Neurology Meeting.—The German Society for Neurology, jointly with the German Society for Physiological Chemistry and the German Society for Neurosurgery, will hold its annual meeting in Hamburg, Sept. 25-27. Among the subjects to be discussed are metabolism, permeability of the nervous system, edema, aneurysms, and angiomas of the brain. For information, write to the Secretary of the German Society of Neurology, Prof. G. Döring, Krankenhaus Heidberg, Hamburg-La 2.

CORRECTION

Cold Sterilization of Instruments.—In the discussion of cold sterilization of instruments in Queries and Minor Notes, THE JOURNAL, April 19, 1952, page 1458, the last paragraph does not indicate clearly that the formula of a noncorrosive formaldehyde solution, which is cited as an example, is the formula for a vehicle in which formaldehyde is later dissolved. Formaldehyde solutions prepared with this vehicle may be any of several strengths, but a 1% solution is commonest for cold sterilization.

EXAMINATIONS AND LICENSURE

NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS: *Parts I and II*, June 18-20; *Part I*, September. *All centers where there are five or more candidates.* Exec. Sec., Dr. John P. Hubbard, 225 S. 15th St., Philadelphia 2.

EXAMINING BOARDS IN SPECIALTIES

AMERICAN BOARD OF ANESTHESIOLOGY: *Oral.* Swampscott, Mass., Sept. 28-Oct. 1. Sec., Dr. C. B. Hickcox, 80 Seymour St., Hartford 15.

AMERICAN BOARD OF INTERNAL MEDICINE: *Written.* Various centers and overseas, Oct. 20. Closing date for the acceptance of applications for the written examination was May 1. *Oral.* Chicago, June 5-7, San Francisco, September or October; New York City, November or December. Subspecialty: Gastroenterology. *Examination.* Chicago, June 7. Exec. Sec.-Treas., Dr. William A. Werrell, 1 West Main Street, Madison 3.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: *Oral.* Chicago, June 7-13, 1952. Final date for filing application was Feb. 1, 1952. Sec., Dr. Robert L. Faulkner, 2105 Adelbert Road, Cleveland 6.

AMERICAN BOARD OF OPHTHALMOLOGY: *Practical.* Chicago, Oct. 6-10 and New York City, June 6-10, 1953. Sec., Dr. Edwin B. Dunphy, 56 Ivie Road, Cape Cottage, Maine.

AMERICAN BOARD OF ORTHOPAEDIC SURGERY: The deadline for the receipt of applications for the 1953 Part II examinations is Aug. 15. Sec., Dr. Harold A. Sofield, 122 S. Michigan Ave., Chicago.

AMERICAN BOARD OF OTOLARYNGOLOGY. *Oral.* Chicago, Oct. 6-10. Sec., Dr. Dean M. Lierle, University Hospitals, Iowa City.

AMERICAN BOARD OF PEDIATRICS: *Oral.* San Francisco, June 27-29; Chicago, Oct. 24-26; Boston, late November. Exec. Sec., Dr. John McK. Mitchell, 6 Cushman Road, Rosemont, Pa.

AMERICAN BOARD OF PHYSICAL MEDICINE AND REHABILITATION: *Parts I and II.* Chicago, June 8 and 9. Sec., Dr. Robert L. Bennett, Georgia Warm Springs Foundation, Warm Springs, Ga.

AMERICAN BOARD OF PREVENTIVE MEDICINE AND PUBLIC HEALTH: Cleveland, Oct. 18-20. Sec., Dr. E. L. Stebbins, 615 N. Wolfe St., Baltimore.

AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY: Chicago, June 13-14. Final date for filing applications was March 15. New York City, Dec. 15-16. Final date for filing applications is Sept. 15. Sec.-Treas., Dr. David A. Boyd, Jr., 102-110 Second Ave. S.W., Rochester, Minn.

AMERICAN BOARD OF RADIOLOGY: *Oral.* Dec. 1-7. Final date for filing application is June 1. Sec., Dr. B. R. Kirklin, 102-110 Second Ave., S.W., Rochester, Minn.

AMERICAN BOARD OF SURGERY: *Written.* Various Centers. October 1952. Final date for filing application is July 1. Sec., Dr. J. Stewart Rodman, 225 15th St., Philadelphia.

MEETINGS

American Medical Association, Chicago, June 9-13. Dr. George F. Lull, 535 North Dearborn St., Chicago 10, Secretary.

American Academy of Tuberculosis Physicians, Chicago, June 7. Dr. Oscar S. Levin, P. O. Box 7011, Denver, Secretary.

American Association for the Study of Neoplastic Diseases, St. Agnes Hospital, Baltimore, June 5-7. Dr. Eugene R. Whitmore, 2139 Wyoming Ave. N.W., Washington, D. C., Secretary.

American Association of Genito-Urinary Surgeons, Seaview Country Club, Absecon, N. J., June 19-21. Dr. Norris J. Heckel, 122 South Michigan Ave., Chicago 3, Secretary.

American Association on Mental Deficiency, Hotel Bellevue-Stratford, Philadelphia, May 26-31. Dr. Neil A. Dayton, P. O. Box 96, Willimantic, Conn., Secretary.

American Blood Irradiation Society, Conrad Hilton Hotel, Chicago, June 7-8. Dr. H. T. Lewis, 5230 Center Ave., Pittsburgh, Secretary.

American College of Chest Physicians, Congress Hotel, Chicago, June 5-8. Mr. Murray Kornfeld, 112 East Chestnut St., Chicago, Executive Secretary.

American Diabetes Association, Drake Hotel, Chicago, June 7-8. Dr. J. A. Reed, 11 West 42d St., New York 36, Secretary.

American Geriatrics Society, Hotel LaSalle, Chicago, June 5-7. Dr. Malford W. Thewlis, 25 Mechanic St., Wakefield, R. I., Secretary.

American Hearing Society, Chicago, June 28. Mrs. Francis E. Lee, 817 14th St. N.W., Washington 5, D. C., Secretary.

American Medical Women's Association, Chicago, June 8. Dr. Lucille Marsh, 1168 Briarcliff Road, N.E., Atlanta, Ga., Corresponding Secretary.

American Ophthalmological Society, Hot Springs, Va., June 5-7. Dr. Maynard C. Wheeler, 30 West 59th St., New York 19, Secretary.

American Orthopedic Association, London, England, June 30-July 4. Dr. C. Leslie Mitchell, Henry Ford Hospital, Detroit 2, Secretary.

American Proctologic Society, Milwaukee, June 4-7. Dr. Stuart T. Ross, 131 Fulton Ave., Hempstead, L. I., N. Y., Secretary.

American Radium Society, Chicago, June 8. Dr. John Wirth, 635 Herkimer St., Pasadena 1, Calif., Secretary.

American Rheumatism Association, Conrad Hilton Hotel, Chicago, June 6-7. Dr. William H. Kammerer, 33 East 61st St., New York 21, Secretary.

American Society for the Study of Sterility, Chicago, June 7-8. Dr. Walter W. Williams, 20 Magnolia Terrace, Springfield 8, Mass., Secretary.

American Therapeutic Society, Blackstone Hotel, Chicago, June 5-8. Dr. Oscar B. Hunter Jr., 915 Nineteenth St. N.W., Washington 6, D. C., Secretary.

American Trudeau Society, Hotel Statler, Boston, May 26. Dr. John D. Steele, 1790 Broadway, New York 19, Secretary.

American Urological Association, Chalfonte-Haddon Hall, Atlantic City, N. J., June 23-26. Dr. Charles H. deT. Shivers, Boardwalk National Arcade Bldg., Atlantic City, N. J., Secretary.

American Veterinary Medical Association, Ambassador Hotel, Atlantic City, N. J., June 23-26. Dr. J. C. Hardenbergh, 600 South Michigan Ave., Chicago 5, Executive Secretary.

Catholic Hospital Association of the United States and Canada, Cleveland, May 26-29. Rev. John J. Flanagan, S.J., 1438 South Grand Blvd., St. Louis 4, Director.

Idaho State Medical Association, Sun Valley, June 15-18. Dr. Robert S. McKeon, 305 Sun Bldg., Boise, Secretary.

Maine Medical Association, Samoset Hotel, Rockland, June 22-24. Mr. W. Mayo Payson, 142 High Street, Portland 3, Executive Secretary.

Medical Library Association, Lake Placid Club, Lake Placid, N. Y., June 24-27. Miss Caroline Riechers, 1758 West Harrison St., Chicago 12, Secretary.

Minnesota State Medical Association, Minneapolis, May 26-28. Dr. B. B. Souster, 496 Lowry Medical Arts Bldg., St. Paul 2, Secretary.

National Tuberculosis Association, Copley Plaza and Statler Hotels, Boston, May 26-30. Mr. Kemp D. Battle, 1790 Broadway, New York 19, Secretary.

North American Chapter, International Society of Angiology, Conrad Hilton Hotel, Chicago, June 7. Dr. Henry Haimovici, 105 East 90th St., New York 28, Secretary.

Post Graduate Medical Assembly of South Texas, Shamrock Hotel, Houston, July 21-23. Dr. C. A. Dwyer, 229 Medical Arts Bldg., Houston, Secretary.

Society for Investigative Dermatology, Hotel Sherman, Chicago, June 7-8. Dr. Herman Beerman, 255 South 17th St., Philadelphia 3, Secretary.

Society for Vascular Surgery, Chicago, June 8, Dr. George D. Lilly, 331 Ingraham Bldg., Miami 32, Fla., Secretary.

The Endocrine Society, Palmer House, Chicago, June 5-7. Dr. Henry H. Turner, 1200 North Walker St., Oklahoma City 3, Secretary.

Upper Peninsula Medical Society, Country Club, Iron Mountain, Mich., June 27-28. Dr. E. Theodore Palm, 412 Superior Ave., Crystal Falls, Mich., Secretary.

West Virginia State Medical Association, The Greenbrier, White Sulphur Springs, July 24-26. Mr. Charles Lively, P. O. Box 1031, Charleston, Executive Secretary.

Wyoming State Medical Society, Nobel Hotel, Lander, June 5-7. Dr. Glenn W. Koford, 2020 Carey Ave., Cheyenne, Secretary.

INTERNATIONAL

Australasian Medical Congress, Melbourne Victoria, Australia, Aug. 22-30. Dr. C. H. Dickson, Medical Society Hall, 426 Albert St., East Melbourne, Victoria, Australia, General Secretary.

Commonwealth and Empire Health and Tuberculosis Conference, Central Hall, London, England, July 8-13. Dr. J. H. Harley Williams, Tavistock House North, Tavistock Sq., London, W.C.1, England, Secretary General.

Congress of the International Diabetes Federation, Leyden, Netherlands, July 7-12. Dr. F. Gerritzen, 33, Prinsegracht, The Hague, Netherlands, Secretary.

European Congress of Cardiology. University of London, Bloomsbury, W.C.1, England, Sept. 10-12. Dr. K. Shirley Smith, 35 Wimpole St., London, W.1, England, Secretary.

European Society of Cardiovascular Surgery, Strasbourg, France, Oct. 3-4. Sir James Learmonth, Department of Surgery, University New Buildings, Edinburgh 8, Scotland.

Interamerican Cardiological Congress, Buenos Aires, Argentina, Aug. 31-Sept. 7. Dr. Blas Moia, Larrea 1132, Buenos Aires, Argentina, Secretary-General.

Inter-American Congress of Public Health, Havana, Cuba, Sept. 27-Oct. 1. Pan-American Sanitary Bureau, 2001 Connecticut Ave., Washington, D. C.

Inter-American Congress of Radiology, Mexico City, Mexico, Nov. 2-8. Dr. Guido Torres Martinez, Marsella No. 11, Mexico, D.F., Secretary-General.

International Congress of Biochemistry, Paris, France, July 21-27. Prof. Jean Courtois, 4, Avenue de l'Observatoire, Paris 6^{e}, France, Secretary.

International Congress of Dermatology and Syphilology, London, England, July 21-26. Dr. Gordon B. Mitchell-Heggs, 5, Lisle St., London, W.C.2, England, General Secretary.

International Congress of Dietetics, Royal Tropical Institute, Amsterdam, The Netherlands, July 7-11. Miss Diane J. Ten Haaf, Educational Bureau of the Nutritional Council, 42 Koninginnegracht, The Hague, Netherlands, General Secretary.

International Congress on Diseases of the Chest, Rio de Janeiro, Brazil, Aug. 24-30. Mr. Murray Kornfeld, 112 East Chestnut St., Chicago 11, Illinois, Executive Secretary.

International Congress of Haematology, Mar del Plata, Argentina, Sept. 21-26. Dr. Carlos Reussi, Anchorena 1710, Buenos Aires, Argentina, Secretary.

International Congress of Health Technicians, Palais de la Mutualite, Paris, France, June 9-14. Secretariat General, 6 Square Desaix, Paris XV^{e}, France.

International Congress of the History of Medicine, Nice-Cannes, France, and Monaco, Sept. 8-18. Dr. F. A. Sondervorst, 124 Avenue des Allies, Louvain, Belgium, Secretary-General.

International Congress on Hydatid Disease, Santiago, Chile, Nov. 21-24. Organizing Committee, P. O. Box 9183, Santiago, Chile.

International Congress of Internal Medicine, Friends House, London, N.W.1, Eng. Sept. 15-18. Sir Harold Boldero, 12 Pall Mall East, London, S.W.1, England, Secretary.

International Congress on Medical Records, London, England, Sept. 7-12. Miss Gwen Perkins, 120 C Street S.E., Washington, D. C., Chairman.

International Congress of Medicine and Sport, Paris, France. May 29-June 1. Prof. Chailley-Bert, 1 rue Lacretelle, Paris 15^{e}, France, Chairman.

International Congress on Neuropathology, Rome, Italy, Sept. 8-13. Dr. Armando Ferraro, 722 W. 168th St., New York, N. Y., U. S. A., Secretary General.

International Congress of Physical Medicine, London, England, July 14-19. Dr. A. C. Boyle, 45, Lincoln's Inn Fields, London, W.C.2, England, Hon. Secretary.

International Congress of Physiopathology of Animal Reproduction and Artificial Insemination, Copenhagen, Denmark, July 7-10. Prof. Ed. Sorensen, The Royal Veterinary and Agricultural College, Bülowsvej 13, Copenhagen V, Denmark.

International Congress of Urology, The Waldorf-Astoria, New York, N. Y., U. S. A., Sept. 15-18. Dr. John A. Taylor, 2 East 54th St., New York, N. Y., U. S. A., Secretary-General.

International Society of Geographic Pathology, Liège, Belgium, July 15-18. Dr. Fred C. Roulet, Habelstr. 24, Basel, Switzerland, Secretary General.

International Union Against Tuberculosis, Rio de Janeiro, Brazil, Aug. 24-27. Prof. Etienne Bernard, 66 Blvd. St. Michel, Paris 6e, France, Secretary-General.

Neuroradiologic Symposium, Stockholm, Sweden, Sept. 17-20. Docent Ake Lindbom, Symposium Neuroradiologicum, Serafimerlasarettet, Stockholm K., Sweden, Secretary.

World Medical Association, Athens, Greece, Oct. 12-16. Dr. Louis H. Bauer, 2 East 103d St., New York 29, N. Y., Secretary General.

DEATHS

Gottlieb, Julius ⊕ Lewiston, Maine; born in Jerusalem, Jan. 2, 1896; Boston University School of Medicine, 1924; specialist certified by the American Board of Pathology; certified by the National Board of Medical Examiners; member of the College of American Pathologists; fellow of the American College of Physicians; in 1933 elected chairman of the Maine State Cancer Committee; assistant professor of postgraduate pathology and bacteriology at Tufts College Medical School; instructor in bacteriology and pathology, Boston University School of Medicine, from 1927 to 1935; professor of bacteriology at Colby College; affiliated with Augusta (Me.) General Hospital, Bath (Me.) Memorial Hospital, Brunswick (Me.) Hospital, Camden (Me.) Community Hospital, Franklin County Memorial Hospital in Farmington, Henrietta D. Goodall Hospital in Sanford, Gardiner (Me.) General Hospital, Knox County General Hospital in Rockland, Miles Memorial Hospital in Damariscotta, Redington Memorial Hospital, Skowhegan, Rumford (Me.) Community Hospital, St. Andrews Hospital in Boothbay Harbor, Sisters' Hospital and Thayer Hospital in Waterville and the Central Maine General Hospital; surgeon in the U. S. Public Health Service Reserve; associate editor of the *Maine Medical Journal;* died Feb. 17, aged 56, of coronary heart disease.

Marshall, George Guerin ⊕ Rutland, Vt.; born Sept. 18, 1867; University of Vermont College of Medicine, Burlington, 1893; specialist certified by the American Board of Ophthalmology; member of the House of Delegates of the American Medical Association in 1946; member of the American Academy of Ophthalmology and Otolaryngology; past president of the Rutland County Medical Society and Vermont State Medical Society; fellow of the American College of Surgeons; served during World War I; at one time member of the school board; formerly on the staff of Proctor Hospital in Proctor, Springfield Hospital in Springfield and Rutland Hospital; died March 1, aged 84, of coronary insufficiency.

Stone, Theodore Thaddeus ⊕ Chicago; born in Chicago Aug. 3, 1897; University of Illinois College of Medicine, Chicago, 1920; professor of nervous and mental diseases at Northwestern University Medical School; specialist certified by the American Board of Psychiatry and Neurology; member of the American Neurological Association, American Association of Neuropathologists, Association for Research in Nervous and Mental Diseases and Central Neuropsychiatric Association; fellow of the American College of Physicians; chairman of division of neurology and psychiatry and attending neurologist, Wesley Memorial Hospital; died in Woodstock, Ill., March 5, aged 54, of tuberculosis of the bladder.

Cox, Gerard Hutchison, Saranac Lake, N. Y.; Columbia University College of Physicians and Surgeons, New York, 1903; specialist certified by the American Board of Otolaryngology and the American Board of Plastic Surgery; member of the American Otological Society; fellow of the American College of Surgeons; an Associate Fellow of the American Medical Association; consulting plastic surgeon, North Country Community Hospital in Glen Cove and the Meadowbrook Hospital in Hempstead; consulting otolaryngologist for the Veterans Administration Hospital at Sunmount and the Mercy Hospital in Tupper Lake; died recently, aged 74, of carcinoma.

Frick, John Howard ⊕ Philadelphia; Temple University School of Medicine, Philadelphia, 1912; served on the faculty of his alma mater, where he had been a trustee; member of the founders group of the American Board of Surgery; fellow of the American College of Surgeons; consulting surgeon, Eastern State Penitentiary; on the courtesy staff, Hospital of the Woman's Medical College of Pennsylvania and St. Luke's and Children's Medical Center; past president of the General Alumni Association at Temple University; died in Frankford Hospital Feb. 27, aged 66, of cerebral hemorrhage.

Blanton, Joseph Clary, Richmond, Va.; Medical College of Virginia, Richmond, 1900; member of the American Medical Association; died recently, aged 83, of carcinoma of the prostate.

Cochran, Robert Henry ⊕ Coleman, Texas; Atlanta College of Physicians and Surgeons, 1902; served overseas during World War I; on the staff of the Overall Memorial Hospital, where he died Feb. 24, aged 75.

Cox, Seth Leroy ⊕ Seattle; Jefferson Medical College of Philadelphia, 1912; member of the Kansas Medical Society, American College of Chest Physicians and the American Trudeau Society; for many years executive secretary of the Kansas Tuberculosis and Health Association; served during World War I; died Feb. 26, aged 70, of heart disease.

Cundiff, Walter Roscoe, Somerset, Ky.; Hospital College of Medicine, Louisville, Ky., 1907; past president of the Pulaski County Medical Society; served on the staff of the Somerset City Hospital, where he died Feb. 15, aged 82, of coronary thrombosis.

Darst, Robert Edward, Chicago; Northwestern University Medical School, Chicago, 1951; resident physician at Wesley Memorial Hospital; died Feb. 29, aged 27.

Davis, Henry Clarke ⊕ San Francisco; University of Toronto Faculty of Medicine, Toronto, Ont., Canada, 1911; served overseas during World War I; died in Boyes Hot Springs, Calif., Feb. 28, aged 64.

Dibrell, John Raleigh ⊕ Little Rock, Ark.; University of Arkansas School of Medicine, Little Rock, 1900; specialist certified by the American Board of Internal Medicine; fellow of the American College of Physicians; past president of the state and city boards of health; served on the staffs of St. Vincent Infirmary and Arkansas Baptist Hospital; died Feb. 24, aged 74, of cerebral hemorrhage.

Doty, Roy A., Rogersville, Tenn.; Lincoln Memorial University Medical Department, Knoxville, 1913; member of the American Medical Association; died in Greeneville Feb. 19, aged 67.

Eshbaugh, Walter S., Marengo, Ill.; the Hahnemann Medical College and Hospital, Chicago, 1881; for many years deputy coroner of McHenry County and health officer of Marengo; died in St. Joseph's Hospital, Belvidere, Jan. 29, aged 95.

Evans, Emery Ericson, St. Louis; Beaumont Hospital Medical College, St. Louis, 1901; member of the American Medical Association; died Feb. 28, aged 76, of coronary occlusion.

Frank, Morris Samuel ⊕ Bayonne, N. J.; Cornell University Medical College, New York, 1909; fellow of the International College of Surgeons; served on the staffs of the Margaret Hague Maternity Hospital in Jersey City and Bayonne Hospital; died Jan. 1, aged 65, of arteriosclerotic heart disease.

Grant, Stephen Hunter ⊕ Deport, Texas; University of Texas School of Medicine, Galveston, 1903; president of the Lamar County Medical Society; member of the American Academy of General Practice; died recently, aged 72, of coronary occlusion.

Gray, George Henry, Hyannis, Mass.; University of Vermont College of Medicine, Burlington, 1888; member of the American Medical Association and the New England Surgical Society; fellow of the American College of Surgeons; past president of the Essex County Medical Society; served during World War I; consulting surgeon at the Cape Cod Hospital, where he had been director and chief surgeon for many years; died Feb. 19, aged 88, of arteriosclerosis.

Grayston, Fred W., Huntington, Ind.; College of Physicians and Surgeons of Chicago, 1895; member of the American Medical Association; health commissioner of Huntington County; past president of the Huntington County Medical Society; died Feb. 20, aged 81, of chronic myocarditis.

⊕ Indicates Fellow of the American Medical Association.

Ice, Noel Carlysle, McAllen, Texas; Western Reserve University School of Medicine, Cleveland, 1917; member of the American Medical Association; affiliated with McAllen Municipal Hospital; died Feb. 6, aged 62, of acute pulmonary edema and rheumatic heart disease.

Johnston, Milton L., Harrod, Ohio; Eclectic Medical Institute, Cincinnati, 1885; died Dec. 23, aged 90.

McGavin, Jessie M., Portland, Ore.; Northwestern University Woman's Medical School, Chicago, 1896; member of the American Medical Association; served on the staff of the Multnomah County Hospital; died Feb. 27.

Neely, Augustus Theodore, Newberry, S. C.; Medical College of the State of South Carolina, Charleston, 1913; died in Baptist Hospital, Columbia, Feb. 1, aged 64.

Norton, William Harrison, Mount Rainier, Md.; George Washington University School of Medicine, Washington, D. C., 1916; also a graduate in pharmacy; served during World War I; member of the American Medical Association; affiliated with Prince George's General Hospital in Cheverly, Md., George Washington University Hospital in Washington, D. C., and the Sibley Memorial Hospital in Washington, D. C., where he died Feb. 28, aged 64, of coronary thrombosis.

Owen, Samuel Henry Clay, Detroit; Meharry Medical College, Nashville, Tenn., 1917; on the staff of the Parkside Hospital; died recently, aged 60, of coronary occlusion.

Owens, Maurice E. Broadas, Richmond, Va.; University of Maryland School of Medicine, Baltimore, 1910; died recently, aged 67, of bronchopneumonia and hypertensive cardiorenal disease.

St. Benno, Richard, Glen Ellyn, Ill.; College of Medicine and Surgery (Physio-Medical) Chicago, 1905; died recently, aged 93, of malnutrition.

Sarven, James David, Cleveland; University of Illinois College of Medicine, Chicago, 1927; died suddenly in Tampa, Fla., Feb. 18, aged 57, of coronary occlusion.

Savage, Gerald Theophilus, Milwaukee; Milwaukee Medical College, 1911; member of the American Medical Association; served during World War I; died Feb. 14, aged 72, of coronary sclerosis.

Steel, John C., Chagrin Falls, Ohio; Cleveland University of Medicine and Surgery, 1897; served as postmaster and as mayor; died Feb. 12, aged 82, of cerebral thrombosis.

Stockton, Marcellus Lowry, Oroville, Calif.; Columbus Medical College, 1887; served during World War I; at one time a member of the state legislature of Kansas; died recently, aged 89, of coronary thrombosis.

Stokes, James Bell, Excello, Mo.; National University of Arts and Sciences Medical Department, St. Louis, 1918; served as county coroner; died in Fulton Jan. 17, aged 64, of cerebral hemorrhage.

Stone, Otis Bush, Libertytown, Md.; University of Maryland School of Medicine, Baltimore, 1893; member of the staff of Frederick Memorial Hospital in Frederick; died Jan. 5, aged 81.

Taylor, William Braxton, Dexter, Ga.; University of Georgia Medical Department, Augusta, 1890; Atlanta Medical College, 1897; died Feb. 18, aged 85, of cerebral hemorrhage.

Teisberg, Carl Benjamin ⊕ St. Paul; University of Minnesota College of Medicine and Surgery, Minneapolis, 1906; fellow of the American College of Surgeons; on the staffs of St. Joseph's, St. Luke's, Miller, and Ancker hospitals; died Feb. 9, aged 72, of coronary thrombosis.

Thill, George Eugene ⊕ Milwaukee; Marquette University School of Medicine, Milwaukee, 1931; member of the American Academy of General Practice; instructor at Mount Mary College; on the staffs of St. Anthony and Deaconess hospitals; died Jan. 5, aged 46, when his private plane crashed in Lake Michigan.

Thomas, Thomas R., Lima, Ohio; Rush Medical College, Chicago, 1899; fellow of the American College of Surgeons; died in Lima Memorial Hospital Feb. 10, aged 78, of coronary thrombosis.

Thompson, Frederick Gregg, St. Joseph, Mo.; Trinity Medical College, Toronto, Ont., Canada, 1888; member of the American Medical Association; fellow of the American College of Surgeons; visiting surgeon, St. Joseph's and Missouri Methodist hospitals; consulting surgeon, Ellis Fischer Cancer Hospital in Columbia; senior consultant, Thompson-Brumm-Knepper Clinic; died Feb. 5, aged 86, of coronary occlusion.

Thumme, Harry Frederic ⊕ Sebewaing, Mich.; Detroit College of Medicine, 1921; served during World War I; died Feb. 1, aged 56, of cerebral hemorrhage.

Tidmore, Joseph Christopher, Dawson, Ga.; Emory University School of Medicine, 1936; affiliated with Terrell County Hospital; county physician; died in Piedmont Hospital, Atlanta, Jan. 18, aged 40, of uremia.

Todd, Calvin Deverde, Washington, D. C.; Toledo Medical College, 1907; for many years affiliated with Veterans Administration; died in Chevy Chase, Md., Jan. 11, aged 74.

Tomlinson, William Elijah Jr., Richmond, Va.; Medical College of Virginia, Richmond, 1929; served during World War II; physician for the Du Pont Company; died Jan. 27, aged 44.

Tonnous, Thomas Scander, Pleasant City, Ohio; Marquette University School of Medicine, Milwaukee, 1943; member of the American Medical Association; served during World War II; on the staffs of Swan Hospital and St. Francis Hospital, in Cambridge, where he died Jan. 11, aged 34, of coronary occlusion.

Vincent, William Tecumseh Sherman, La Porte, Texas; Medical College of Ohio, Cincinnati, 1889; died Jan. 12, aged 87, of heart disease.

Ware, Marvin Brister, Jackson, Miss.; Jefferson Medical College of Philadelphia, 1929; member of the American Medical Association and Southeastern Surgical Congress; fellow of the American College of Surgeons; visiting surgeon, Mississippi Baptist and Mississippi State Charity hospitals; died Feb. 25, aged 46, of coronary thrombosis.

Watson, Harry Thomas, Gallup, N. Mex.; Keokuk Medical College, College of Physicians and Surgeons, 1906; past president of the New Mexico Board of Medical Examiners; associated with the Indian Service; died in St. Joseph's Hospital, Keokuk, Iowa, Jan. 22, aged 71, of bronchopneumonia and pulmonary tuberculosis.

Webster, George Alexander Milton, Chicago; Meharry Medical College, Nashville, Tenn., 1923; died Feb. 14, aged 58, of coronary heart disease.

Weller, Edward V., Pittsburgh; Western Pennsylvania Medical College, Pittsburgh, 1900; member of the American Medical Association; affiliated with Presbyterian Hospital; died Feb. 20, aged 81, of cerebral hemorrhage.

Welliver, William Evan ⊕ Lock Haven, Pa.; University of Pennsylvania School of Medicine, Philadelphia, 1910; affiliated with Lock Haven Hospital, where he died Jan. 22, aged 65, of complications resulting from gout.

West, Thomas Marshall, Havertown, Pa.; University of Maryland School of Medicine, Baltimore, 1908; fellow of the American College of Surgeons; on the staff of the Williamsport (Pa.) Hospital; died in Bryn Mawr (Pa.) Hospital Feb. 18, aged 75, of uremia and nephrosclerosis.

Weum, Thurston William ⊕ Minneapolis; Northwestern University Medical School, Chicago, 1908; member of the Central Association of Obstetricians and Gynecologists; fellow of the American College of Surgeons; clinical instructor of obstetrics and gynecology at University of Minnesota Medical School; affiliated with University of Minnesota Hospital, St. Mary's Hospital and Northwestern Hospital; died recently, aged 69, of hypertensive arteriosclerotic carditis.

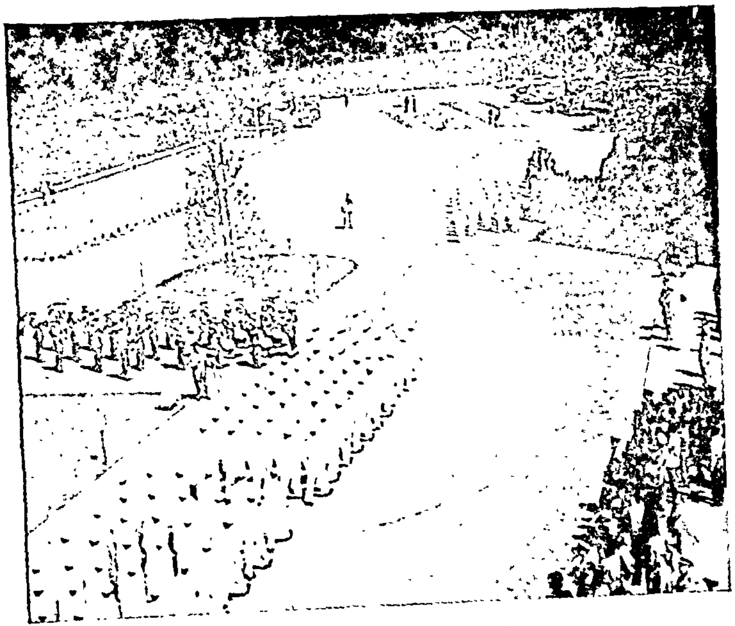
Whiteside, John McIntyre, Talladega, Ala.; Vanderbilt University School of Medicine, Nashville, Tenn., 1884; University of Nashville Medical Department, 1884; member of the American Medical Association; died in Citizens' Hospital Dec. 27, aged 89, of cerebral thrombosis.

GOVERNMENT SERVICES

NAVY

New Head of Medical Center.—Rear Adm. Bertram Groesbeck Jr. became the new commanding officer of the National Naval Medical Center at Bethesda, Md., April 30. The traditional naval ceremony was witnessed by many official guests and high ranking officers, and was followed by a review of the various naval companies on duty at the medical center.

Rear Admiral Groesbeck was first commissioned in the Naval Reserve on April 7, 1917. In a few months he transferred to the regular Navy. His rank as rear admiral dates from 1942. In 1922 he was ordered to the Pensacola Naval Air Station for instruction in aviation and since then has served at various naval air stations in this country and abroad. Among the ships on which he has served are the USS Xarifa, USS Houston, USS Canopus, USS Luzon, USS Yorktown, USS Enterprise, USS Kittery, and the USS Jasson. He has also served at various naval hospitals, at the medical research laboratory at Mitchel Field in Long Island, in the Pacific area during World War II and on the staff of the Commander Air Forces, Pacific fleet, from December, 1944, to September, 1945. He was formerly chief of the Division of Aviation Medicine in the Bureau of Medicine and Surgery and became assistant chief of the bureau in 1951. In addition to his experience in aviation medicine, he is especially qualified in the diseases of the eye, ear, nose, and throat. Among various medals and honors which Admiral Groesbeck has received is the Lyster Award from the Aero Medical Association, of which he is now the president-elect.



Review for the new commandant.

Dr. Karsner Lectures in Cleveland.—Dr. Howard T. Karsner, medical research advisor to the Surgeon General, lectured to the staff of Crile Veterans Administration Hospital May 15, at Cleveland, on "Diseases of the Blood Vessels of the Lungs." Dr. Karsner, while in Cleveland, also was the principal speaker at the 50th anniversary celebration of the Cleveland Academy of Medicine. During the celebration on May 18, at convocation ceremonies of civic organizations, he gave an address entitled "The Past Is Prelude," which was a review of the advancements in medicine during the past 50 years.

Rear Admiral Agnew Retires.—Rear Adm. William J. C. Agnew, commanding officer of the National Naval Medical Center, was transferred to the retired list of the U. S. Naval Service on May 1, 1952. On April 30 a change of command ceremony was held to pay tribute to the retiring admiral on his completion of more than 35 years of active service in the Navy, and to welcome aboard the new commanding officer, Rear Adm. Bertram Groesbeck Jr. (MC), USN.

PUBLIC HEALTH SERVICE

Trainees from Foreign Countries.—Three members of the faculty of the Medical College Dacca, Pakistan, are among the foreign trainees who have come to the United States under the sponsorship of the Public Health Service, in cooperation with the Mutual Security Agency and the Technical Cooperation Administration. Among other new arrivals in the past two months are three physicians from Thailand, Pakistan, and Brazil, a veterinarian from Thailand, and a sanitary engineer from the Netherlands.

The three members of the Dacca Medical College faculty are: Drs. Anwar Ali, A. K. M. Abdul Wahed, and Md. Abdul Karim. Dr. Ali is professor of pathology at the Medical College and bacteriologist and serologist to the Government of East Bengal. He will devote his year's study to work in pathology. Dr. Wahed, who is a graduate of Calcutta Medical College and has studied in London and Edinburgh, is professor of medicine. His postgraduate training in the United States will be in internal medicine. Dr. Karim, also a graduate of Calcutta Medical College and professor of physiology at Dacca Medical College, will take training in physiology. All three physicians are studying under grants from the Technical Cooperation Administration.

Also from Dacca, Pakistan, is Dr. Amjad Ali Talukder, who is assistant director of public health, Dacca Circle, East Bengal. Dr. Talukder is a graduate of the Medical College of Calcutta and the All India Institute of Hygiene and Public Health. He will spend four months in this country studying tuberculosis control.

Among the trainees from Thailand are Drs. Sombhong Siribhakdi and Dr. Tiang Tan Sanguan. Dr. Siribhakdi, assistant director of the Chiengrai Government Hospital, will spend a year in the United States studying general surgery, surgical pathology, and anatomy. Dr. Sanguan, who is a lecturer in bacteriology on the faculty of Veterinary Science, University of Medical Science, Bangkok, and was formerly head of the vaccine and serum production section, department of livestock development, will spend six months touring the United States to visit veterinary schools and serum and vaccine producing laboratories.

A medical officer in the Service Especial de Saude Publica of Belem, Brazil, Dr. Rainerode Carualbo Maroja will spend four months in the study of the bacteriology of enteric organisms under a Technical Cooperation Administration grant.

New Chief of States Services.—The appointment of Dr. Otis L. Anderson as chief of the Bureau of State Services, Public Health Service, has been announced. Dr. Anderson succeeds Dr. Joseph W. Mountin, who died suddenly on April 26. He will direct the broad federal-state and interstate programs of the service. These programs encompass most of the public health activity carried on in cooperation with the states and with local communities. They include work in the fields of tuberculosis, venereal diseases and chronic diseases, water pollution control, occupational health activities and vital statistics, along with the administration of the Public Health Service grant-in-aid program to states. In addition to its headquarters' activities, the bureau also administers three field stations: The Communicable Disease Center at Atlanta, Ga.; the Environmental Health Center, Cincinnati; and The Arctic Health Center, Anchorage, Alaska. Dr. Anderson, a native of Lincoln, Neb., entered the commissioned corps of the Public Health Service in July, 1930, on completion of his internship at the Public Health Service Hospital, Baltimore, Md. He is a Fellow of the American Medical Association and of the American College of Physicians, a diplomate of the American Board of Preventive Medicine and Public Health, and a member of the American Public Health Association, the American Hospital Association, and the Association of Military Surgeons.

FOREIGN LETTERS

LONDON

Physicians' Pay.—Under the National Health Service, general practitioners are remunerated from what is known as a "central pool," into which is paid a sum of money made up essentially of (*a*) £19,890,000, the estimated net remuneration of general practitioners in 1939, (*b*) a "betterment factor," and (*c*) a sum for expenses. The amount paid into the central pool for the year ended March 31, 1951, was 18*s*. per person for 95% of the population, a total of £41,533,000. The figure for the estimated net remuneration of general practitioners in 1939 was based on a recommendation of the Spens Committee, which was named after the chairman, Sir William Spens. The committee was organized during the preliminary discussions that preceded the setting up of the National Health Service to advise on the amount of remuneration that general practitioners should receive. The committee also recommended that this remuneration be based on the estimated net income of physicians plus a betterment factor to allow for the increased cost of living and the increased income of other professions. It was on the condition that the betterment factor be the subject of immediate negotiation that the general practitioners of Great Britain, through the British Medical Association, consented to take part in the National Health Service on its inauguration in 1948. These negotiations came to nought. Mr. Bevan, then Minister of Health, arbitrarily fixed a betterment factor of 20% on net incomes and refused to alter this figure. It was not until he was succeeded in office by Mr. Marquand that a more reasonable and conciliatory atmosphere developed, the result of which was that Mr. Marquand made an offer to submit the matter to an independent adjudicator to be appointed by the lord chancellor. He promised to accept the decision of the adjudicator, provided the British Medical Association did the same and provided the British Medical Association agreed to the organizing of a working party, consisting of representatives of the Ministry of Health and the British Medical Association, to consider means for the more efficient and equitable distribution of the central pool. This offer was accepted by the British Medical Association, and, in due course, Mr. Justice Danckwerts, a High Court judge, was appointed adjudicator.

Mr. Justice Danckwerts has now made his award, which is based on a betterment factor of 100%, and the increase is to be retroactive to 1948, with adjusted betterment factors for previous years, e. g., 85% for 1948. This award, which was immediately agreed to by Mr. Crookshank, the present Minister of Health, will involve the government in an additional expenditure of £40,000,000, subject to improved methods of distributing the central pool agreed upon by the working party, which is now considering the problem. It is not altogether a surprise that the announcement of this award is already being used for political purposes by certain members of the party now in opposition in Parliament. It is, therefore, necessary to emphasize that this is merely the belated carrying out of a promise that was made to the general practitioners when they consented to come into the service. As *The Times* points out, the Danckwerts award means that "the family doctor has been underpaid by the State ever since the health service was launched."

The tendency since the inception of the National Health Service has been to glorify the specialist at the expense of the general practitioner, with the inevitable result that the pick of the young graduates have tended to go into specialist, or consultant, practice. Two major problems are involved; the first is to insure that, in order to obtain a reasonable income, a general practitioner should not need to take on an excessive number of patients, as is at present the case. One way that has been suggested for overcoming this difficulty is to provide a larger capitation fee for the first 2,000 patients, with a rapidly diminishing fee for the next 1,000. The other problem concerns giving general practitioners access to hospital beds. If general practitioners could make a reasonable income with fewer patients than at present and have access to hospital beds, not only would their standard of work rise but also the waiting lists and congestion in outpatient departments in hospitals would automatically decrease. It is generally agreed by those running the National Health Service that a satisfactory general practitioner service would do more for the solvency and efficiency of the service than anything else.

Cancer in London.—In 1938, the British Empire Cancer Campaign instituted a survey of cancer in all the hospitals in the county of London. In spite of the 1939 to 1945 war, it was possible to obtain the requisite details of 15,201 cases, and a five-year follow-up was successful in all but 400 (2.63%) of the cases. A detailed analysis of this material, prepared by Lieut. Col. W. L. Harnett, the secretary to the clinical cancer research committee of the British Empire Cancer Campaign, has now been published under the title of "Survey of Cancer in London." In his introduction, Sir Heneage Ogilvie describes it as "something unique in scientific literature. Never has so large a series, entirely unselected, representing the results of research not by one expert, but by the staffs of many hospitals, been collected. Never has an analysis so detailed, so carefully checked, and so impartial, been presented." It is "a fairly representative sample of the population of Southern England." Space can only be found here for a survey of some of the more salient findings. The stomach (12.2%), rectum (12.11%), lungs (12%), and skin (9.43%) were the commonest sites in males; in females, the breasts (29.7%) and the cervix uteri (11.99%) were the commonest sites. The peak incidence for both sexes was in the age group 60 to 65 years, 17.97% for men, and 14.38% for women. Prior to this, the percentage incidence in each age group from 25 years onwards was higher in women, but, after 65 years, the percentage incidence in each age group was lower in women. Although the "difference between the percentages of males and females who gave a family history of cancer" was statistically significant, the absence of control figures and the high proportion of case histories in which the question was not answered "renders it impossible to draw definite conclusions." Occupations that showed a significant excess were: (1) general and dock laborers, cancer of the lip, mouth, and penis; (2) brewers, publicans, barmen, and waiters, cancer of the pharynx, esophagus, and rectum; (3) agricultural laborers, gardeners, and florists, cancer of the lip, mouth, tongue, prostate, and rodent ulcer and squamous cell cancer of the skin; (4) chemical workers, workers in pitch tar or mineral oil, and makers of coal gas, skin cancer in all the sites mentioned and also, in coal gas workers, rodent ulcer; (5) singers, actors, and clergymen, cancer of the larynx; and (6) engineers, fitters, and mechanics, "a slight excess of cancer of the stomach, and an apparent excess of cancer of the lung." The interval between the first symptom and the first consultation with a physician was under three months for 53.1% of the patients and over six months for 20.8%. There was much variation in these figures, according to the region affected. In cases of cancer of female genital organs, a vaginal examination was made within one month of the first consultation in 80.3% of the patients; the corresponding figure for rectal examination in cancer of the rectum and anus was 61.6%. On admission to hospital, only 29.9% of the cancers were in stage 1 ("confined to tissue or organ of origin, lymph nodes not involved clinically") and 21.4% were in stage 4 ("remote metastases present") and, therefore, inoperable. The percentage of patients known to be alive at the end of five years was 36.5% for those who underwent radical surgery, 40.1% for those treated by radical combined methods, and 25.2% for patients treated by radiotherapy. The percentages of five year survivals in stage 1 were 55.2% for patients treated by radical combined methods, 47.5% for those treated by radical surgery, and 43.7% for those treated by radiotherapy. A [illegible] of 23%

The items in these letters are contributed by regular correspondents in the various foreign countries.

Dr. Robert Fleig Library

of all patients were unsuitable for any form of treatment, because of poor general condition or the advanced stage of the disease.

William Harvey.—The mayor of Folkestone invited representatives of the Harveian Society, the Edinburgh Harveian Society, the Royal College of Physicians, the Royal Society of Medicine, Gonville and Caius College, Cambridge, Merton College, Oxford, St. Bartholomew's Hospital, the British Medical Association, and the Grocers Company to come to Folkestone April 1, to celebrate William Harvey's birth there in 1578 and to discuss the question of removing the remains of Harvey. A resolution was adopted to the effect that Harvey's remains be removed from Hempstead Church in Essex to a more appropriate resting place. The four alternatives that were mentioned were Folkestone Parish Church, Canterbury Cathedral, Westminster Abbey, and St. Bartholomew's, London. The president of the Harveian Society reported that it was only a matter of time before Hempstead Church fell into ruins. First-aid repairs had been effected last year, but £16,000 to £25,000 would be required to restore and endow the church. Neither church funds, the medical profession, or the Society for the Protection of Ancient Buildings could do anything to meet this expenditure. The only solution, therefore, appeared to be transfer of the remains to another resting place. A letter was read from the Bishop of Colchester, in whose diocese Hempstead lies, stating that he intended to oppose to the utmost a transfer of the sarcophagus from Hempstead. He added that he had been informed that, in his will, Harvey had asked to be buried at Hempstead. This was denied by the president of the Harveian Society.

Hypnotism—Stage and Medical.—In view of the recent reference in this correspondence to stage hypnotism, it is of interest to record that a stage hypnotist has now had £1,000 damages awarded against him. He was sued by a young lady who volunteered to be an experimental subject on the stage. She claimed damages on the grounds that the stage hypnotist had been negligent in that he had instilled depressing suggestions into her mind and had not, before bringing her out of her trance, implanted in her mind any reassuring belief that all was really well and that she had no cause to be frightened. She alleged that because of this she subsequently suffered from depression for a long time. At present, a bill is before Parliament, sponsored by a number of medical members of Parliament, "to make illegal the demonstration of hypnotic phenomena for purposes of public entertainment." Hypnotism is defined as follows: " 'Hypnotism' includes mesmerism and any similar act or process which produces or is intended to produce in any person any form of induced sleep or trance in which the susceptibility of the mind of that person to suggestion or direction is increased or intended to be increased but does not include hypnotism, mesmerism or any such similar act or process which is self-induced." There is a clause exempting from the enactments of the bill hypnotism "for scientific or research purposes or for the treatment of mental or physical disease."

Diphtheria Statistics.—Records showing a new low for diphtheria incidence have just been announced by the Ministry of Health. In 1951, in England and Wales, there were 32 deaths and 699 notified cases. The corresponding figures for 1950 were 49 and 959. At the same time, a detailed analysis of the figures for 1950 have been issued. This shows that, during this year, in the 83 county boroughs in England and Wales, there were 70 in which there were no deaths from diphtheria and 33 in which there were no confirmed cases. During the five year period 1946-1950, in 14 country boroughs, with a total population of nearly 1,125,000, there was not a single death. It is estimated that if an unimmunized child develops diphtheria, his chances of dying from it are seven times greater than those of an immunized child. In an accompanying statement, Dr. W. P. D. Logan, chief medical statistician of the General Register Office, states, "The situation is now being reached . . . where the eradication of diphtheria as an indigenous disease in this country can be foreseen as a very real possibility within the next few years, providing there is no slackening in the immunization efforts that have been so dramatically successful in the past 10 years."

NORWAY

Treatment of Alcoholics in General Hospitals.—Hitherto, it has generally been assumed that the medical ward of a general hospital is not a suitable place for the treatment of chronic alcoholism. This traditional teaching has recently been challenged by several hospital physicians in Norway, and, since May, 1951, a deliberate break has been made with it at the Stavanger City Hospital, where the medical department is in the charge of Dr. Per Hanssen. One of his colleagues, Dr. Arnfinn Engeset, recently reported on this experiment, the success of which he mainly attributes to the cooperation of two local organizations for alcoholics; the members of these groups are pledged to help one another in curing themselves. Experience with this experiment has shown that there is little prospect of success unless treatment is supported by such organizations. Indeed, the importance attached to this cooperation is so great that lately one of the conditions required of candidates for admission to the Stavanger City Hospital is that they first establish contact with one of the two local organizations. These organizations should keep in touch with the patient before and after hospital treatment.

Only 1 of the first 42 patients treated since May, 1951, was so disorderly that he gave the nurses serious trouble. The patients were kept in bed for the first three days, without clothes. Recently, they have, as a rule, been allowed to get up sooner, and smoking has been allowed at certain hours. The patients are taught to regard their alcoholism as a disease requiring medical treatment, as does any other illness. This teaching puts them on the same footing psychologically as their fellow-patients. Dr. Engeset learned the importance of injections of insulin and tetraethylthiuram disulfide (antabuse®) or "aversan" bis (diethylthiocarbamyl) disulfide given orally. The increased appetite resulting from the insulin injection helped to promote a sense of well-being and check the craving for more alcohol. Barbiturates, on the other hand, are not thought highly of as a remedy for chronic alcoholism in the Stavanger hospital. In large doses, they are apt to induce giddiness and partial loss of consciousness, and chronic alcoholics are often tempted to resort to barbiturates as a substitute for alcohol. The distaste for alcohol created by tetraethylthiuram disulfide was, as a rule, experienced only a few hours after its administration, and, even when this drug was discontinued on the patient's discharge from hospital, its effects continued to be felt for several days.

Fetal and Neonatal Mortality.—Prof. Leif Salomonsen, who is in charge of the children's department of the Rikshospital in Oslo, recently gave a statistical report on neonatal mortality, i. e., mortality during the first month of life. Although there has been a marked fall in infant mortality, i. e., mortality during the first 12 months of life, there has not been a corresponding improvement in the neonatal mortality rate as is shown by the following figures for Oslo, where, between 1900 and 1950, the infant mortality rate fell from 125 to 21 per 1,000 live births. In the same period, the deaths occurring during the first month of life, expressed as a percentage of the deaths occurring during the first 12 months of life, rose from 24 to 61 per 1,000. At present, about 17 per 1,000 of the live births in Norway end in death during the first month. About 50% of these deaths occur during the first day of life, 32% during the rest of the first week, 9% during the second week, 6% during the third week, and 3% during the fourth week. These figures stress the well-known observation that the first day of life is the most critical. As is true of the premature infant, the postmature infant, born after a pregnancy lasting more than 290 days, is in great danger during the first day of life. Postmature infants weighing more than 4,000 gm. and measuring more than 54 cm. in length constitute about 2% of all births.

Professor Salomonsen calculates that if the number of fetal deaths (stillbirths) is added to the number of neonatal deaths, about 3.5% of the infants born in Norway die before, during, or shortly after birth, a loss of about 2,300 human lives out of 65,000 babies born in Norway every year. The task of reducing mortality at the beginning of life is much hampered by the lack of accurate data regarding the true causes of death. The clinical and pathological-anatomic evidence of the causes of death is often incomplete, and about half the deaths are officially recorded as being due to congenital debility plus malformations. Such fatal debility in infancy is comparable with the equally noncommittal and noninformative diagnosis of debility as a cause of death among old persons.

Professor Salomonsen contrasts the relative ignorance and impotence marking the present state of affairs before and directly after birth with the success recently achieved in reducing the mortality during the first 12 months of life. One of his compatriots, Dr. Utheim-Toverud, showed that a well-organized infant welfare scheme in one section of Oslo reduced the infant mortality rate in the period 1939-1944 to 14 per 1,000, whereas the corresponding figure for the same period for the whole of Oslo was 30 per 1,000. Dr. Rietz gave statistics for Sweden showing the same low infant mortality rate of 14 per 1,000 in well-to-do families in Stockholm at a time when the infant mortality rate for the whole of Sweden was between 60 and 70 per 1,000.

Statistical Cancer Research.—In cooperation with the World Health Organization and on the same lines as those followed by Denmark, England, France, Canada, Holland, Switzerland, and some sections of the United States, the Norwegian public health service has taken steps to provide for a unified system of registration of cases of cancer in Norway. A committee on which senior hospital physicians, pathologists, radiologists, and statisticians were represented has devised a registration form the details of which represent a compromise over the ideal form. As the new form may not be ideal in every detail, the physicians to whom it is sent are invited to give constructive criticism of it. Patients with cases diagnosed before October 17, 1951, are not to be included in the new register, even if they present themselves for reexamination or renewed treatment after this date. Supplementary information is required once a year about the patients registered after this date, and such items as change of diagnosis or change of clinical condition (recurrences, metastases, etc.) are also to be reported. Dr. Fredrik Mellbye, who is head of one of the departments of the Norwegian Ministry of Health, is in charge of the new cancer register.

Another statistical study of cancer has recently been undertaken by Prof. Leif Kreyberg, who is circularizing all physicians in Norway with the request that they fill in and return to him a form giving details about their tobacco habits. In cooperation with Professor Kennaway of St. Bartholomew's Hospital, London, the Institute for General and Experimental Pathology at the University of Oslo is seeking, by this inquiry, to ascertain whether there is any connection between smoking and cancer of the lungs. The physicians circularized are requested to state their sex, as Professor Kreyberg wishes to distinguish between the smoking habits of the sexes.

All-Scandinavian School of Public Health.—On the initiative of the Norwegian Public Health Service, discussions have been taking place for some time between the representatives of the public health services of Denmark, Finland, Iceland, and Sweden about the creation of an all-Scandinavian school of public health with headquarters in Gothenburg. These Scandinavian countries have a total population of 18 to 19 million, but, individually, they are too small to run separate schools of public health. It is for this reason that the postgraduate study of public health has entailed a considerable exodus to foreign countries, where public health conditions and problems are not exactly the same as in the Scandinavian countries. It is hoped that the proposed school in Gothenburg may ultimately serve the needs of all Scandinavian public health specialists and also become a center of learning that will be attractive to physicians in other countries. The municipal authorities of Gothenburg have already put a site at the disposal of the proposed school, and cooperation has been assured between the school and Gothenburg's Technical High School in regard to sanitary engineering. The Kellogg Foundation, the Rockefeller Foundation, and the World Health Organization have shown great interest in this scheme. It was, however, made clear last fall at a meeting of the representatives of the Scandinavian public health services that Denmark was not as interested as the other Scandinavian countries in the scheme, as the need for specialists in this field is not great in Denmark. In commenting on the situation and the possibility that American aid may not be forthcoming, Dr. Karl Evang, who is head of the Norwegian Public Health Service, writes in *Nordisk Medicin* for March 28, that, in his opinion, it would be a great mistake to abandon the scheme for want of such aid. The Scandinavian countries should, he thinks, be able, if necessary, to solve this problem without aid from abroad.

SWEDEN

In Fiscal Defense of "Brain Workers."—Sveriges Akademikers Centralorgnisation (SACO) is an organization about which a keen controversy has been raging in Sweden. The name can be translated as Sweden's Central Organization of Academicians. This body is not, however, solely concerned with academicians in the Anglo-Saxon sense, having as its members "brain workers," intellectuals and scholars, such as school teachers, lawyers, engineers, physicians, and veterinary surgeons. At first, SACO was not taken seriously, and, because it embraced so many different groups, private persons as well as state and municipal employees, it was anticipated that uniformity of action would be difficult, if not impossible. But lately, SACO has been the object of hearty abuse by the left wing press; it has evidently become a power to be reckoned with.

SACO's aim is to defend the fiscal interests of its members and to help them overcome difficulties with regard to such problems as fair promotion. When negotiations between its members and state and municipal employers prove unsatisfactory to the former, it uses the strike or threat of strike as a lever, confining such action to one small group at a time, so that the cost of action by this group can be borne without difficulty by the members groups. Thus, early in February, a group of teachers working at 14 different schools handed in their resignations. A few days later, a group of state-employed lawyers did the same. A group of electrical engineers followed suit, and so the siege has continued, stage by stage. The Swedish Medical Association, which is affiliated with SACO, has threatened to join in the conflict by sending the government the resignations of its government-employed members, with notice to the effect that the corresponding appointments will not be sought when vacant by other members of the association. Every member of the association is invited to contribute 50 Swedish crowns a month to a fund to finance the strikes. As pointed out in the organ of the Swedish Medical Association, the academic conflict is not concerned only with salaries. It is also concerned with the right of physicians to maintain their professional status. In the left wing lay press, SACO's action is described as reactionary, and its employment of the strike as a persuasive factor while bargaining is severely censured.

The Sequelae of Thrombosis in the Legs.—Acute venous thrombosis in the legs has, until recently, been treated with offhand resignation; if the patient did not promptly die of pulmonary embolism, he was discharged from the hospital as cured after six to eight weeks. With growing appreciation of the seriousness and numerical importance of these cases, the staff of the Serafimer Hospital recently started a survey of the incidence of acute venous thrombosis in Sweden. At the annual meeting of the Swedish Surgical Society in 1950, Dr. Gunnar Bauer of Mariestad called for a national survey of this condition, with reference to its incidence in Sweden. He also pledged for more rational treatment than had hitherto been employed. In a communication to the Société Internationale de Chirurgie, delivered as an opening address in Paris, in September, 1951, he showed by results achieved how much can be done by early diagnosis and modern treatment, including injections of heparin and operations such as division of the popliteal vein.

The importance of early diagnosis was demonstrated by citing the cases of 421 patients who had been admitted to the hospital for other complaints and in whom thromboses had developed after admission. This accident involved the deep veins of the leg below the knee in 404 patients (96%). The femoral vein or the pelvic veins were involved in 7 patients, and, in 10 other patients, the site of origin of the thrombosis could not be determined with accuracy. A group of 228 patients in whom acute thrombosis was discovered while the disease was limited to the part of the leg below the knee, was subjected to a follow-up examination 10 months to two years later. Among the patients in whom the disease had been arrested at the time of its discovery, there were 160 who were found, on reexamination, to be completely symptom-free, whereas there were 65 who suffered from no other sequel than slight edema at the end of the day. There remained only three patients who, on reexamination, were found to have severe swelling of the leg. Dr. Bauer attributes this remarkable achievement mainly to early diagnosis and injections of heparin. He also gave injections of heparin when thrombosis extended to the thigh, but, in such cases, follow-up examinations have shown results inferior to those cited above. With regard to operative treatment, Dr. Bauer has been interested in resection of the popliteal vein, a procedure which, since it was first attempted in Mariestad, in 1947, has been carried out 440 times for the relief of pain, chronic edema, and indurative changes in the skin. Satisfactory healing occurred after operation in more than 87% of the patients. Dr. Bauer finds it difficult to discriminate between the merits of this operation and others such as sympathectomy.

Multiple Inoculations in Infancy.—At Uppsala, a system of multiple inoculation during the first year of life has recently been extended to all the child welfare centers run by the municipal authorities. In their account of this system, Drs. Ericsson, Hesselvik, and Vahlquist have pointed out that inoculation should be started at the age of 3 months, when the congenital passive immunity of an infant has ceased to be effective. At this stage, a triple whooping cough, diphtheria, and tetanus vaccine is given by subcutaneous injection and repeated twice, at intervals of about six weeks. This triple vaccine, prepared by the Swedish State Bacteriological Laboratory, does not provoke any alarming local reactions, and the momentary pain that it causes may be appreciably reduced by the addition of lidocaine (xylocaine) hydrochloride, in a concentration of 0.33%, to the vaccine. There were only three cases of subcutaneous sterile abscess formation at the site of the injection in the course of 1,500 injections. These abscesses healed uneventfully after aspiration and were probably caused by the presence of aluminum in the vaccine.

At the time the triple vaccine is given, tuberculin testing is done. BCG and smallpox vaccination are also given. An additional reason for crowding all the inoculations into the first year of life is the fear of poliomyelitis in connection with them if they are given later in life. Whatever the connection between inoculations and poliomyelitis may be, it is evident that the effect is practically unknown in infancy, which is thus a comparatively safe time for prophylactic vaccinations. As both diphtheria and tetanus are much reduced in frequency (there were only 40 cases of diphtheria in Sweden in 1950, and there are only 30 cases of tetanus every year), vaccination against these diseases hardly seems necessary.

Compensation for Tuberculosis as an Occupational Disease.—In a motion dated Jan. 24, 1952, addressed to the Swedish Parliament, attention is drawn to the hardships inflicted on persons who have contracted tuberculosis in asylums, sanatoriums, and other hospitals; their cases are not classified as occupational diseases qualifying for financial compensation. A few years ago, an attempt was made to revise the law of June 14, 1929, in this respect, and, in 1948, the Swedish Ministry of Health and the National Insurance Institute issued a report on an inquiry into the incidence of tuberculosis in the personnel of various hospitals during the period 1942-1944. This inquiry brought out some striking facts. In the state asylums, the annual number of cases of tuberculosis per 1,000 posts or appointments was 20.3 for the age group 20 to 24 years, whereas it was only 8.3 for the same age group in general and fever hospitals. For all the age groups together, the rate was 6.2 per 1,000 for the asylums and 5.5 per 1,000 for the hospitals. The difference between the hospitals and the sanatoriums for all the age groups together was still greater, the figure of 5.5 per 1,000 for the hospitals being much smaller than the 15.2 per 1,000 for the tuberculosis institutions. Would-be employees of sanatoriums and other tuberculosis institutions are required to be tuberculin-positive before they begin work, and it is possible that the high tuberculosis rate in sanatorium personnel may be due, in part, to superinfection.

CORRESPONDENCE

LABORATORY PITFALLS IN DIAGNOSIS OF THYROTOXICOSIS

To the Editor:—The diagnosis of thyrotoxicosis has been facilitated by the determination of the protein bound iodine in the blood and by the uptake of I^{131} by the thyroid; however, there are many patients with borderline laboratory results suggestive of thyrotoxicosis but who are clinically not thyrotoxic. This anomaly has been observed in other clinics besides our own. The difficult diagnostic and therapeutic problems presented by these patients directed our attention to a number of factors that must be weighed carefully before final evaluation of the total clinical picture is made. It is felt that unless diagnosis of these borderline cases remains on a clinical level the uncritical physician may attach undue value to an abnormally high basal metabolic rate, high uptake of I^{131} by the thyroid, or increased protein bound iodine.

False values in protein bound iodine and in the uptake of I^{131} are commonly observed in patients who have ingested desiccated thyroid, antithyroid drugs, and iodine-containing medication or radiopaque material. Repeated administration of mercurial diuretics may lower the blood iodine, because the mercurial can remove iodine by combining with it. Iodine-poor diets may also influence both the blood iodine and the uptake of tracer doses of I^{131}.

The function of the thyroid is influenced by many dynamic factors and is therefore subject to normal physiological fluctuations, such variations being readily reflected in changes of oxygen consumption or in the uptake of iodine. An increased basal metabolic rate is frequently manifested by the nervous or apprehensive patient. Such an abnormal test may be restored to normal by suitable sedation.

We now feel that acute and chronic anxiety may also stimulate transient and fluctuating hyperfunction of the thyroid, as shown by an increased basal metabolic rate or uptake of I^{131} by the gland. Yet such patients do not necessarily manifest clinical thyrotoxicosis, because continued observation with and without sedation and/or reassurance will frequently be followed by restoration of normal thyroid function together with normal laboratory tests. We suggest that in such cases spontaneous remission of a transitory hyperfunction had taken place or speculate that anxiety can influence thyroid function and that suppression of the anxiety by psychotherapy or by the simple device of sedating the patient during the diagnostic study will yield a normal basal metabolic rate and uptake of I^{131}. We have data, incomplete at this time, that suggest that sedation given between tests can restore to normal not only an increased basal metabolic rate but also the uptake of I^{131}. Empirical though this observation may be now, it would be in harmony with the fundamental physiological principle that thyroid function is responsive to emotional stimulation.

Unless the borderline cases or those patients suffering from anxiety are observed long enough, preferably with the help of suitable sedation, the abnormal laboratory data may mislead the unwary clinician, who will direct his patient to treatment for thyrotoxicosis rather than to the necessary psychotherapy. We suspect that such diagnostic and therapeutic errors are not infrequently made.

It must be emphasized again that the diagnosis of thyrotoxicosis rests not on laboratory data alone but rather on the total picture presented by the patient.

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BUREAU OF LEGAL MEDICINE AND LEGISLATION

SUMMARY OF STATE LEGISLATION OF INTEREST TO PHYSICIANS ENACTED DURING THE 1951 LEGISLATIVE SEASON

Including special sessions, the legislatures of almost every state were in session some time during the year 1951. Hundreds of proposals of definite interest to the medical and allied professions were considered. Many of these were reported in the Organization Section of THE JOURNAL at the time of their introduction or enactment, or both; the rest were merely indexed and placed in the Bureau's files, so that they may be referred to later if occasion for studying them arises. The following survey makes no attempt to report all of the proposals in which physicians might have an interest, or even all of such proposals that were eventually enacted into law. It is concerned only with what seem to be the most important of the proposals that actually became law in some state.

Allied Professions and Sundry Vocations

Chiropody.—A Pennsylvania law amended the definition of chiropody so that such practice would not include the amputation of the leg, foot, or toes or the treatment of systemic diseases of the bones, ligaments, or muscles of the feet or any part of the body, and a New Jersey law amended the Disability Benefits Law so as to authorize the treatment by chiropodists of persons claiming benefits thereunder.

Medical Technicians.—A California law provided for the licensing of clinical laboratory technicians, clinical laboratory technician trainees, and clinical laboratories. A clinical laboratory technician is defined as a person licensed to perform the technical procedures called for in a clinical laboratory under the direction of a clinical laboratory technologist or physician and surgeon.

Nursing.—A Pennsylvania law provides for the licensing and regulating of professional nurses. Laws providing for the licensing of professional and practical nurses were enacted in Florida, Idaho, and Tennessee. Laws providing for the licensure of practical nurses were enacted in New Hampshire and Vermont. New laws creating boards of examiners for vocational nurses were enacted in California and Texas. A Connecticut law provided an appropriation to the state department of health to establish a program of financial assistance to nurses who agree to practice in Connecticut for at least four years after they are licensed, and a Minnesota law authorized the state board of education to award nursing scholarships under certain circumstances to residents of the state. A Massachusetts law lowered the age limit for applicants for a nursing license from 20 to 19, and a New Hampshire law reduced the age limit from 21 to 20. A Pennsylvania law provided a deficiency appropriation to assist state-aided medical and surgical hospitals in meeting the cost of training student nurses.

Ophthalmic Dispensing—Opticians.—North Carolina and Wisconsin enacted licensing laws for dispensing opticians that permit dispensing opticians to replace or duplicate lenses without a prescription.

Optometry.—Laws in Minnesota, Tennessee, and Texas permit optometrists to make the necessary examinations of persons seeking assistance for the blind. An Indiana law provided for the creation of a school of optometry at Indiana University, and an Oklahoma law required the annual attendance at postgraduate programs of at least two days by persons licensed to practice optometry in the state. One Pennsylvania law amended the definition of optometry to read: "The examination of human eye and the analysis of ocular functions or the prescribing, providing, furnishing, adapting or employing any or all kinds and types of lenses and prisms, visual training, orthoptics, ocular exercises and any and all preventive and corrective methods for the aid, correction or relief of the human eye, its associated structures, appendages and functions." Another Pennsylvania law provided that the testimony of an optometrist licensed to practice in the state shall be received by any official board, commission, or agency as qualified evidence and that such institutions shall not discriminate between the practitioners of optometry and any other ocular practitioners.

Pharmacy.—A Montana law defined a prescription as an order given individually for the person for whom prescribed directly from the prescriber to the furnisher or indirectly to the furnisher by means of an order signed by the prescriber and bearing the name and address of the prescriber, his license classification, the name of the patient, the name and the quantity of the drug or drugs prescribed, the direction for the use, and the date of its issue. A Pennsylvania law defined a prescription as an order for drugs or medicines or combinations or mixtures thereof written or signed by a duly licensed physician, dentist, or veterinarian or other medical practitioner licensed to write prescriptions intended for the treatment or prevention of disease in man or animals.

Disease Control and Public Health

Rehabilitation Programs.—A West Virginia law provided regulations for the establishment, operation, and maintenance of centers for the vocational rehabilitation of disabled persons.

School Health Programs.—A Pennsylvania law authorized the board of education to furnish free milk to pupils attending kindergarten and the first grade. New laws relating to state appropriations and the use of federal funds in connection with school health programs were enacted in Arizona, Massachusetts, Oklahoma, South Dakota, Wisconsin, and Wyoming.

Alcoholism.—A Florida law provided for the establishment and operation of a state hospital for alcoholism, and a Texas law provided facilities for care and treatment of alcoholics. Laws providing for the creation of commissions or groups to study the problem of alcoholism were enacted in Georgia, Massachusetts, Minnesota, North Dakota, Rhode Island, and Vermont.

Communicable Diseases.—An Idaho law granted the department of public health the power to adopt and enforce rules for preventing the spread of infectious, communicable, and contagious diseases, and an Ohio law provided for the isolation and quarantine of persons exposed to and suffering from communicable diseases.

Epilepsy.—A California law amended the Welfare and Institutions Code by adding regulations relating to epileptics, among which are provisions making it possible to commit such persons to state hospitals when they are in need of treatment or when they are suffering from mental illness in addition to epilepsy.

Tuberculosis.—A Michigan law directed the Michigan Tuberculosis Sanatorium Commission to study the needs for alteration and construction of existing and new facilities for the treatment of persons suffering from tuberculosis. New laws in Florida and New York provided regulations relating to the isolation and treatment of persons having tuberculosis. Michigan and North Carolina provided appropriations for the construction of additional hospital facilities for tuberculosis sufferers, and Illinois authorized cities and villages to levy taxes for the operation of a tuberculosis sanatorium.

Physical Examination Programs.—New laws in New Hampshire and North Carolina made it unlawful for an employer to require an employee or applicant for employment to pay the cost of a medical examination or the cost of furnishing any records required by the employer as a condition of employment. A Massachusetts law amended the law relating to physical examinations of school children by providing that tests of sight and hearing shall be performed by teachers, physicians, optometrists, nurses, or other approved personnel and that a child would be exempt on religious ground from such examination on written request of his parent or guardian. A Vermont law required superintendents of schools to cause a qualified person to test the hearing of all pupils under his supervision in grades one, two, three, five, seven, and nine. The prior law permitted such examinations to be made by teachers.

Prepared by George E. Hall, Bureau of Legal Medicine and Legislation.

Foods, Drugs, Cosmetics, and Therapeutic Devices

Barbiturates, Hypnotics, Sulfonamides, and Other Drugs.—A California law amended the health and safety code by requiring hospitals to keep a record of the administration of hypnotic drugs, including the amount given, the type, the date, and the name and address of the person to whom administered. Another California law created an interim committee on narcotics and hypnotics to ascertain, study, and analyze all facts relating to narcotics and hypnotics including the operation, effect, administration, enforcement and needed revision of all laws bearing on the subject. Other new laws restricting the sale of certain drugs to sale on prescription were enacted in Arkansas, California, Connecticut, New Mexico, and Texas. The Arkansas law amended a 1935 law that applied only to barbituric acid by adding amphetamine and desoxynorephedrine. The California law applied to phenylhydantoin and hypnotic drugs. The Connecticut law added antibiotics, injectable biologicals, and sulfonamides to the existing list of prescription drugs. The New Mexico law applied to "dangerous drugs," which was defined to include hypnotic drugs, aminopyrine, cinchophen, diethylstilbestrol, ergot, cotton root, sulfonilamide, thyroid, and compounds thereof. The Texas law applied to barbituric acid, amphetamine, and desoxyephedrine.

Food and Drug Acts.—An amendment to the California Food and Drug Act provided that certain advertising restrictions in relation to drugs would not apply when the periodicals in which the advertisement is placed is intended or disseminated only to members of the medical, dental, pharmaceutical, or veterinary professions or to other practitioners of the healing art licensed to practice in the state. Two Connecticut laws amended the Food and Drug Act by providing that an article shall be misbranded if the label implies that the product is recommended or endorsed by any agency of the federal or state governments unless such agency has approved such statement prior to its use. New Mexico enacted the uniform Food, Drug, and Cosmetic Act.

Narcotics.—Washington enacted a uniform narcotic drug act. California and New York created special commissions to study and analyze facts and existing state laws relating to narcotics and hypnotics and their use and control. The New York law related only to narcotics. Other laws that also created commissions to study and survey the narcotic problem within the respective states were enacted in Michigan and New Jersey. An Illinois law provided for the establishment of a narcotics hospital in the city of Chicago and outpatient clinics in the city of Chicago, both for the treatment of narcotic addicts. New laws that either fixed or increased the penalties for selling narcotics to a minor were enacted in Alabama, California, Connecticut, Massachusetts, and Michigan. One Connecticut law defined narcotic drug to include isonipecaine (meperidine hydrochloride) and another amended the narcotic act by defining the word opiate as including all synthetic drugs having addiction forming or addiction sustaining properties similar to morphine and so proclaimed by the President of the United States under the provisions of the federal narcotic law.

Miscellaneous.—A Connecticut law provided that manufacturers shall not sell drugs to hospitals that are not recognized by the state department of health as a general or special hospital or to institutions not having a full-time pharmacist. A Maine law authorized the department of health to procure and distribute within the state antitoxins, serums, vaccines, viruses, and analogous products applicable to the prevention or cure of disease in man, for the purpose of aiding in national defense in case of war or emergency.

Hospitals

Licensing Requirements.—New laws in California and Illinois provided for the licensing and regulating of hospitals for the mentally ill. Three laws were enacted relating to the licensing of nursing homes. An Illinois law amended the existing law relating to the licensing of nursing homes by creating an advisory nursing home council. A Washington law provided regulations for the licensing and regulation of nursing homes. A Wisconsin law repealed and reenacted the law relating to nursing homes and, among other things, set up a new definition of nursing home and authorized the use of the injunctive process against any person or agency operating such a home without the required license or without being registered. New laws in Nevada, New York, and Washington provided regulations for the licensing of maternity or lying-in hospitals, and a Michigan law provided certain amendments to the existing law on this subject. A Florida law provided that no person shall operate a chiropractic hospital without first obtaining a license from the Florida State Board of Chiropractic Examiners. A Minnesota law amended the hospital licensing law by increasing the size of the advisory council from seven to nine and by defining hospitalization, maternity care, and chronic or convalescent care.

Liens.—A Florida law provided circumstances whereby hospitals may obtain a lien for all reasonable charges for the hospital care, treatment, and maintenance of ill or injured persons upon any and all causes of action accruing to such persons or their legal representatives.

Miscellaneous.—A Texas law resolved that the House go on record as requesting the Board of State Hospitals and Special Schools to take the necessary steps to meet the minimum standards required in order to qualify said hospitals and special schools operated by the state to meet the necessary standards for residency, intern, and nurses training programs, so that the patients of the said hospitals and special schools may be given the highest type of medical care and treatment possible.

Regulation of Healing Arts Practice

Annual Registration.—New laws in Florida and Vermont required the annual renewal of licenses of practitioners of medicine. The Vermont law provided for a forfeiture of license of persons who fail to annually renew as required. An Oklahoma law provided that if a person fails for three consecutive years to obtain a renewal certificate of registration, his original license to practice medicine or surgery will be automatically suspended.

Basic Science Laws.—Nevada enacted a basic science law requiring all persons, before taking an examination for a license to practice the healing art or any branch thereof, to present a certificate of ability in anotomy, physiology, chemistry, bacteriology, and pathology. The "healing art" is defined to include any system, treatment, operation, diagnosis, prescription, or practice for the ascertainment, cure, relief, palliation, adjustment, or correction of any human disease, ailment, deformity, injury, or unhealthy, abnormal, physical, or mental condition. An Arizona law amended the basic science act by exempting full-time practitioners of medicine for federal, state, county, municipal, or other governmental health departments and persons engaged in full-time practice of medicine for federal or state hospitals or institutions, and a Wisconsin law amended the basic science act by exempting therefrom dental hygienists. A Texas law amended the basic sciences act by permitting the issuance of temporary licenses effective until the next regular meeting of the board.

Citizenship.—A Florida law amended the medical practice act by requiring applicants for a license to be citizens of the United States. Previous law required them only to have filed a declaration of intention to become a citizen. This law also authorized the examining board to accept evidence from an applicant that he has received training in hospitals sufficient to bring his medical education up to a standard equivalent to that of graduates of approved medical schools in the event that the applicant is not a graduate of such a school.

Corporate Practice.—A Connecticut law provided that any three or more persons, licensed pursuant to the medical practice act, could associate to form a corporation without capital stock to own, operate, and maintain a clinic for the study, diagnosis, and treatment of human ailments and injuries by persons duly licensed and to promote medical, surgical, and scientific research and learning, providing that such corporation could not itself give medical or surgical treatment, consultation, or advice and provided that persons duly licensed, and no others, could be members of such corporation. One California law provided that nothing therein should be construed to authorize an insurer to furnish services of hospitals, nurses, or physicians and surgeons or in any manner to direct, participate in, or control the selection of the hospital or physician and surgeon from whom the insured secures services. Another law authorized the board of medical examiners to grant approval of the employment of physicians and surgeons on a salary basis by licensed charitable institutions, foundations, or clinics or by approved medical schools operating clinics therein if no charge for professional services is rendered to patients by the institution.

Chiropractors.—A Pennsylvania law created a state board of chiropractic examiners and defined chiropractic as a system of locating misaligned or displaced vertebrae of the human spine, the examination preparatory to and the adjustments by hand of such misaligned or displaced vertebrae and other articulations, together with the use of scientific instruments of analysis as taught in approved schools and colleges of chiropractic without the use of either drugs or surgery. "Chiropractic" shall not include the practice of obstetrics or reduction of fractures or major dislocations. A Nevada law amended the chiropractic act by providing for the licensing of persons desiring to practice chiropractic physiotherapy, which the law defines to be the adjustment of the articulations of the human body by hand and the use of electrical, mechanical, hygienic, and sanitary measures, which measures do not pierce or sever the body tissues.

An Arkansas law amended the chiropractic act by increasing the number of hours that must be spent in education in a chiropractic school from three years of nine months each or not less than 2,700 sixty-minute resident hours of instruction to four years of nine academic months each or not less than 3,600 sixty-minute resident hours of instruction, and an Iowa law increased the course of study in chiropractic colleges from three to four years and not less than 4,000 sixty-minute hours of actual resident attendance. A Maryland law required the annual registration of chiropractors. A New Hampshire law provided that an applicant to practice chiropractic who matriculated in a chiropractic school after Jan. 1, 1951, shall be a graduate of a legally chartered school requiring for graduation completion of a course of study of not less than 3,600 classroom hours in four academic years. A Maryland law recommended to the director of civilian defense that he enlist the full cooperation and support of the chiropractic profession in whatever program is formulated for civilian defense.

Massage Practitioners.—An Oregon law provided for the creation of an Oregon state board of massage examiners and defined massage as pressure or friction against, stroking and kneading the body, and gymnastics, with or without such appliances as vibrators, infra-red heat, sun lamps, and baths, in order to maintain good health and to establish and maintain the body in good physical condition, provided that no person licensed under this act would be permitted to give chiropractic adjustment, osteopathic manipulations, or naturopathic manipulation.

Midwives.—California eliminated provisions relating to the licensing of midwives.

Naturopaths.—A Wyoming law created a board of naturopathic examiners and defined naturopathy to be a therapeutic system embracing a complete "physianthropy," employing nature's agencies, forces, processes, and products, except major surgery or obstetrics.

Osteopaths.—Pennsylvania laws defined the word medical examiner, in connection with private and parochial school examinations, as including practitioners of osteopathy and osteopathic surgery, and defined the word physician as an individual licensed under the laws of the state to engage in the practice of medicine and surgery or in the practice of osteopathy or osteopathy and surgery and defined the term "qualified physician" under the mental health act as including practitioners of osteopathy and osteopathic surgery. A Wisconsin law amended the medical practice act by eliminating reference to osteopathy and surgery and by providing that, if six members of the board find an applicant qualified, the board shall issue a license to practice medicine and surgery to such applicant. New laws in West Virginia and Vermont amended the osteopathic laws by requiring the annual registration of osteopaths and by requiring further that at the time of the annual registration the applicant show that he has attended a refresher course during the course of the year given by the state osteopathic association.

Physiotherapists.—New laws providing for the licensure of physiotherapists either by the state board of medical examiners or by independent examining boards were enacted in Florida, Georgia, Illinois, Massachusetts, Minnesota, New Hampshire, and North Carolina. A Connecticut law authorized the board of trustees of the University of Connecticut to offer instruction in physical therapy as a part of the University program and to grant suitable degrees therein. A New Mexico law provided that any resident member of the American Physical Therapy Association or the American Registry of Physical Therapists would be eligible for a certificate and license issued by the secretary of the state board of basic science examiners without examination. New York laws designated the board of medical examiners as the board of examiners in physiotherapy and amended the law relating to physiotherapy by providing that the administration of physiotherapy by a person employed under the control of a licensed physician or licensed physiotherapist in his office or in the civil service of the state or any political subdivision thereof, or employed in a duly incorporated hospital, established clinic, or in an infirmary maintained by a person, firm, or corporation employing one or more full-time licensed physicians or licensed physiotherapists would not be prohibited by law.

Psychologists.—Georgia and Minnesota enacted laws providing for the creation of a state board of examiners of psychologists. The Georgia law provided that a psychologist is a person who holds himself out to be an applied psychologist and renders to persons or to the public for fees any service involving the application of recognized principles, methods, and procedures of the science and profession of psychology, such as interviewing, administering, and interpreting tests of mental abilities, aptitudes, interests, and personality characteristics for such purposes as psychological diagnosis, classification, or evaluation or educational or vocational placement or for such purposes as psychological counseling, guidance, or readjustment. Nothing in this law shall be construed as permitting the administration or prescription of drugs or in any way infringing upon the practice of medicine. The Minnesota law contained no definition of psychologist. A New York law amended the mental hygiene law by changing the preliminary educational requirements of certified psychologists from three years' actual clinical experience to three years' full-time or equivalent part-time clinical experience in the psychological examination of children or mental defectives.

Acts Constituting the Practice of Medicine.—A California law amended the business and professions code by providing that whenever the word diagnose or diagnosis are used they shall include any undertaking by any method, device, or procedure whatsoever and whether gratuitous or not to ascertain or establish whether a person is suffering from any physical, mental, or nervous disorder. The law further provided that the terms shall specifically include the taking of a person's blood pressure and the use of mechanical devices or machines for the purpose of representing to any person any conclusion with respect to such person's physical, mental, or nervous condition.

Powers of Boards of Medical Examiners.—A Florida law amended the medical practice act by authorizing the board to pass on the good standing and reputability of any hospital and to determine those that maintain a standard of training sufficient to be recognized by the board when considering medical examinations given by the board. One California law amended the business and professions code by providing that every physician who while in attendance on patients is intoxicated to such an extent as to impair his ability to conduct the practice authorized by his certificate shall be guilty of a misdemeanor, and another amended the business and professions code by providing that the adjudication of insanity or mental illness or the voluntary commitment or admission to a state hospital of any licentiate for a mental illness shall operate as a suspension of his right to practice. A Florida law amended the medical practice act by making adjudication of insanity by a court of competent jurisdiction a ground for discipline. An Illinois law amended the medical practice act by permitting the suspension of a license to practice medicine on the entry of a decree by any court of competent jurisdiction establishing mental illness of any person holding a license under the medical practice act.

Internship.—An Oregon law amended the medical practice act by, among other things, providing that the one-year internship requirement be eliminated so that if, by reason of the national emergency, any shorter period of internship in a hospital approved for internship by the American Medical Association is served and the applicant thereafter completes the one-year period as a resident in such hospital or as a commissioned medical officer of the armed forces, such applicant will be deemed to have fulfilled the internship requirement.

Examinations.—A California law amended the business and professions code relating to the subjects of examination for a physician's and surgeon's certificate by eliminating materia medica, pharmacology, and therapeutics and substituting therefor pathology—gross and microscopic.

Graduates of Foreign Medical Schools.—A California law amended the business and professions code relating to applicants for a physician's and surgeon's certificate whose application is based on a diploma from a foreign medical school by providing that in lieu of a one-year internship in a hospital approved by the board the applicant may have completed his final year of medical instruction in an approved medical school in the United States. A West Virginia law amended the medical practice act by admitting to the examination any person who shall have graduated from a medical school on or after Jan. 1, 1939, and who meets all the requirements of the law pertaining to education and training except that the medical school was not at the time of graduation a class A medical school as defined by statute.

Licensure Without Examination—Reciprocity.—New laws in Alabama, California, and Maine amend the medical practice act of their states with respect to the granting of reciprocity certificates to applicants applying for medical licensure.

National Board of Medical Examiners.—A Wisconsin law authorized the board of medical examiners to issue licenses to practice medicine and surgery or osteopathy and surgery and to accept, in lieu of its own examination, the certificate of the National Board of Medical Examiners.

Recording of Licenses and Fees Therefor.—A New York law amended the education law by requiring practitioners of medicine to register their certificates with the county clerk.

Preliminary Education.—A California law amended the business and professions code by providing that applicants for the physician's and surgeon's examination who graduate from school after Jan. 1, 1955, must present evidence of having completed a three-year resident course of college grade, including the subjects of physics, chemistry, and biology before commencing the study of medicine.

Temporary Licenses.—A Texas law amended the medical practice act by permitting the issuance of temporary licenses to be effective until the next regular meeting of the board. A Delaware law empowered the Medical Council of Delaware to issue temporary emergency certificates, limited to 12 months' duration and renewable at the discretion of the issuing authority, to physicians and surgeons licensed in another state whom they find qualified to practice during an emergency. The holder of such temporary certificate shall be privileged, during the term specified therein, to practice his profession in the state subject to such regulations, restrictions, and area limitations as the Medical Council may impose. One Illinois law amended the medical practice act by providing regulations for the issuance of temporary certificates of registration to persons who are nonresidents of the state, who have a Doctor of Medicine degree and who wish to pursue programs of graduate or specialty training in the state, and another authorized the department of registration and education to issue limited licenses to practice medicine to persons who have received training in a school of good standing with the board and who have been appointed a resident physician in a hospital maintained by the state to participate in a specialized training program. These limited licenses would entitle the physicians to practice medicine only in the hospital designated on the license. A Nevada law authorized the board of medical examiners to issue temporary licenses or permits granting applicants the right to serve as resident medical officers in any hospital in the state. They would not permit the holder to engage in the private practice of medicine. A New Hampshire law amended the medical practice act by authorizing the board of medical examiners to issue temporary five-year licenses to alien physicians who had taken out their first citizenship papers and are otherwise qualified. If the alien becomes a citizen during the five years he shall be issued a permanent license. A New York law provides that when the commissioner of health deems an emergency to exist in the department by reason of a lack of sufficient physicians, he may present evidence thereof to the Civil Service Commission, which may determine the existence of an emergency and waive the requirements of the civil service law as regards citizenship for physicians until such emergency ceases to exist. This waiver would apply only for physicians working with the department.

Veterans.—A California law amended the business and professions code by establishing regulations relating to the reinstatement of licenses of persons serving in the armed forces, and an Indiana law provided that persons lawfully inducted into the military service who were licensed to practice a profession in the state at the time of such induction may have six months after termination of their military service to apply for a renewal license without examination, reexamination, fine, or penalty.

Injunctions.—A Wisconsin law authorized the board of medical examiners and the board of chiropractic examiners to make use of the injunctive process to restrain violations of the respective laws, and an Oklahoma law authorized the use of the injunctive process to enforce the provisions of their respective acts by the board of chiropody, chiropractic examiners, medical examiners, optometry examiners, and osteopathic examiners.

Exemptions.—A Connecticut law amended the medical practice act by exempting chiropractors from the requirements thereof. A California law amended the business and professions code relating to qualifications for the practice of medicine by providing that the provisions applicable to applications by United States commissioned medical officers shall also be applicable to applicants who were in the armed forces of the United States during the period from Dec. 7, 1941, to Dec. 31, 1946, and who were bona fide residents of California prior to entering medical school. A Pennsylvania law authorized the state board of medical examiners to grant licenses to persons resident of the commonwealth who at the time of becoming members of the armed forces were in all other respects qualified according to law but were prevented from taking the examination by reason of their induction in the armed forces. A Florida law amended the medical practice act by exempting therefrom optometrists and pharmacists duly licensed by their own boards and also persons furnishing medical assistance in case of emergency. This law also required the registration of resident physicians, assistant resident physicians, and interns. A New Mexico law amended the medical practice act by providing that nothing therein should be construed to prohibit a physician who had been lawfully licensed to practice in another state from entering into a contract with a New Mexico state institution to serve as a member of the medical staff exclusively or from entering into a contract with an employer for the treatment of its employees only, provided such employer maintains a hospital for the benefit of its employees and provided the person submits proof that he has received a notification by the medical examining board of New Mexico that he possesses the necessary character and qualifications.

Interns and Resident Physicians.—A California law permitted hospitals to appoint graduates of approved schools as residents or assistant residents, and such persons may hold such positions for one year without obtaining a license to practice in the state.

Miscellaneous.—A Colorado law amended the medical practice act by, among other things, including two osteopaths on the medical examining board, and a Florida law made the records of the examining board prima facie evidence of the issuance of a license to any person or persons.

Rights and Privileges, Duties and Liabilities of Practitioners

Rights and Privileges.—A Florida law provided that all citizens and taxpayers of the county shall have the right to be admitted to any hospital or hospitals supported in whole or in part by taxes collected in Bay County, Florida, and operated in that county, and in the management of such hospital or hospitals no discrimination shall be made against any physician or surgeon, provided such physician or surgeon has been admitted to the general practice of medicine or surgery under the laws of the state, and all such physicians or surgeons shall have equal privileges in treating patients in said hospital or hospitals. The law further provided that the board of trustees shall organize a staff of physicians and surgeons composed of every practicing physician and surgeon in the county, and such physicians and surgeons shall hold their position on said staff as long as they comply with the rules and regulations laid down by the Board of Trustees. An Ohio law provided for the issuance of special automobile licenses bearing the word "Physician" to persons holding unrevoked and unexpired licenses to practice medicine in the state. A Texas law provided that all practitioners of the healing art should indicate the system of the healing art which he is licensed to practice on any sign, pamphlet, letterhead, or the like. A Georgia law repealed an existing law imposing a tax on professions. A California law provided regulations relating to the sale of drugs, chemicals, and medicines but further provided that such regulations would not apply to the sale of sterilized sutures, hypodermic needles and syringes, medicinal gases, ether, chloroform, ethyl chloride, injectable anesthetics of the procaine series, sulfonamide creams, ointments and jellies used for introduction into the vaginal tract, where such sale is made to a physician, dentist, chiropodist, veterinarian, pharmacist, medical technician, or medical technologist, to a clinic, hospital, or other similar institution or to an exporter. A North Carolina law provided that, when it shall appear to the medical staff of a state institution that a patient is in need of some type of surgical operation for the preservation or restoration of health and no responsible relative can be located, the medical superintendent or the director of the institution, the surgical consultant, and the local health officer of the county in which the hospital or institution is located shall organize a board to pass on the physical condition of the patient and this board may by unanimous agreement authorize the necessary surgical operation, including the administration of an anesthetic.

Duties and Liabilities.—A Florida law provided that any doctor or other practitioner of the healing sciences making a physical or mental examination of any person shall, on the request of such person or his representative, furnish copies of all reports of such examination or treatment but that such report need not be furnished except on the written authorization of the patient or his representative. An Indiana law provided that all physicians shall report within 10 days to the state board of health in writing the name and address of any person diagnosed by him as having epilepsy or other similar disorder characterized by lapses of consciousness. A California law amended the business and professions code by making it a misdemeanor for a person to use the word "doctor" or abbreviations thereof or implying that he is a physician if he is not. A Nebraska law related to the commitment of persons to state institutions and provided that the petition accompanying the commitment of such person must be accompanied by the certificate of a legally qualified physician with experience in the actual practice of his profession, certifying that he has personally examined the person to whom the application relates and that in his opinion the person is feebleminded and a proper subject for commitment.

Compulsory and Voluntary Medical, Dental, and Hospital Service and Insurance Plans

Prepaid Medical and Hospital Care Plans.—One Illinois law provided regulations for the incorporation of voluntary health services plans corporations, and another Illinois law provided new regulations for the organization of nonprofit hospital service corporations. New laws in Kansas and Nebraska permitted nonprofit hospital and medical service corporations to enter into reciprocity agreements with plans in other states for the benefit of their subscribers. A West Virginia law provided, among other things, that hospital and medical nonprofit corporations must provide in their contracts that, in case of a deficit of available funds, each participating hospital or physician will accept a prorata share of available funds in full settlement of any bill submitted. A Maine law provided an enabling act for the regulation of nonprofit medical service plans. A Connecticut law permitted nonprofit medical service corporations to make payment for the professional services of dentists.

E. M. I. C.—A Minnesota law requested Congress to reenact the emergency maternity and infant care program for wives of men serving in the armed forces.

Accident and Sickness Insurance Disability Compensation.—A Michigan resolution created a special committee to study and investigate and report back to the general assembly the feasibility of disability insurance for the state of Michigan.

Health Insurance.—A Massachusetts law memorialized the Congress of the United States to vote against any legislation that may eventually subject what is now a free and self-reliant people to any form of compulsory health insurance or socialized medicine. A Texas resolution put the state legislature on record as opposing socialized medicine or compulsory health insurance and requested the Texas members of the House of Representatives and Senate of the Congress of the United States to resist legislation setting up socialized medicine or compulsory health insurance.

Workmen's Compensation and Occupational Disease Legislation

Choice of Practitioner.—A Delaware law amended the workmen's compensation act by providing that if an employer shall, on application made to him, refuse to furnish surgical, medical, and hospital services, medicines and supplies, the employee may procure the same and shall receive from the employer the reasonable cost thereof. A Missouri law amended the workmen's compensation act by providing that if an employee desires, he shall have the right to select his own physician, surgeon or other person at his own expense. A South Dakota law permitted injured employees to select their own physicians at their own expense.

Occupational Diseases.—A Florida law provided that any condition or impairment of health of municipal firemen caused by tuberculosis, hypertension, or heart disease would be presumed to have been suffered in line of duty unless the contrary is shown by competent evidence, provided that such firemen shall have successfully passed a physical examination on entering into such service that failed to reveal any evidence of such condition. A Pennsylvania law brought within the coverage of the Occupational Disease Act tuberculosis acquired by a nurse where the occupation involves exposure to such disease. A Utah law provided for the appointment of a medical panel with reference to total permanent disability and deaf cases arising from occupational disease. A Vermont law resulted in the enactment of an occupational disease statute.

Education, Experimentation, and Scientific Aspects of Medicine

Anatomic Acts, Disposition of Dead Bodies.—An Arizona law provided for the creation of an anatomy board for the purpose of distributing certain dead human bodies to qualified institutions and persons for the promotion and furtherance of the science and art of medicine and dentistry. One Florida law amended the law relating to trafficking in the dead body of a human being and provided that nothing in such law should be construed to prohibit the obtaining, dissecting, using, and disposing of dead bodies for the purpose of teaching or other appropriate university research by any medical school, dental school, school of nursing, or other university research or teaching unit that is a part of a regularly established or chartered institution of higher learning under the laws of the state, and another provided that whenever the dead body of a human being shall remain unclaimed by any relative of the deceased for 10 days after death, the board of county commissioners of the county within which the body may be found shall have authority and power to give such body for any educational or research purpose to any medical school, dental school, school of nursing, or other college or university whether within or without the state of Florida. A Kansas law amended the law relating to the disposition of unclaimed dead human bodies and the use of such bodies by the department of anatomy of the medical school of the University of Kansas. A Wisconsin law provided that if a corpse is found in the Mendota State Hospital, the University of Wisconsin shall be notified that it may have such corpse; if the corpse is in the Winnebago State Hospital, Marquette University or any accredited school of mortuary science at Milwaukee shall be notified that it may have such corpse. A Nebraska law provided that it shall be unlawful for any person to throw away or abandon any dead human body, or any part thereof, in any place other than a regular place for burial and under a proper death certificate. A North Carolina law provided regulations whereby any person who may otherwise validly make a will may, by will, dispose of the whole or any part of his or her body to a teaching institution, university, college, state department of health, legally licensed hospital, or any other legally licensed hospital, agency, or commission operating an eye bank, bone or cartilage bank, a blood bank, or any other bank of a similar nature and kind designated for the rehabilitation of the maimed.

Animal Experimentation.—A California law authorized the state board of public health to make, promulgate, modify, amend, or rescind regulations for the control of the humane use of animals for the diagnosis and treatment of human and animal diseases, for research in the advancement of veterinary, dental, medical, and biological sciences, for research in animal and human nutrition and for the testing and diagnosis, improvement, and standardization of laboratory specimens, biologic products, pharmaceuticals, and drugs. An Illinois law provided that institutions requiring, for the effective carrying on of their scientific or educational activities, the use of live dogs or cats may apply to the state department of health for license to obtain animals from a public pound operated by or under contract with municipalities or other political subdivisions. An Oklahoma law provided regulations for the licensing of institutions desiring to obtain animals from established dog pounds for the purpose of investigation or instruction concerning the structure or functions of living organisms, the causes, preventions, control, or cure of diseases or abnormal conditions in human beings or animals. A South Dakota law provided regulations for the licensing of institutions by the state department of health, which institutions desire to obtain animals from establishments maintained by or for municipalities and to use such animals only in the conduct of scientific and educational activities. A Maine law authorized the commissioner to make rules and regulations and to issue permits to any person, firm, or corporation to take, have in possession, band, and transport wild birds and animals for scientific purposes.

Autopsies.—A Kansas law authorized a district judge to order the exhumation of a body of a deceased person for purposes of physical or chemical examination or analysis to determine the cause of death. A South Dakota law authorized the performance of autopsies by a physician or surgeon when authorized (*a*) by the decedent during his lifetime or (*b*) by the decedent's surviving spouse or if (*c*) the surviving spouse is incompetent or not available or if there is no surviving spouse by an adult, child, parent, brother, or sister of the deceased. A Tennessee law permitted counties to enter into contracts with institutions, public or private, to render scientific and medical assistance in connection with law enforcement problems. Contracts may provide for the performance of autopsies, chemical and biological laboratory examinations, toxicological examinations, etc.

Blood Plasma and Blood Banks.—A Maine law provided an appropriation for the purpose of supplying materials in connection with the accumulation, storage, and maintenance of 5,000 units of liquid plasma and 500 units of dried plasma to be available in the event of a disaster. A Michigan law provided for a uniform program of blood typing and the collection of whole blood and blood plasma and prescribed the powers and duties of certain agencies with respect thereto.

Contraception.—A Maryland law made it unlawful to sell contraceptives by means of a vending machine. A New York law provided that no appliances, drugs, or medicinal preparations intended for the prevention or treatment of venereal disease shall be displayed, sold, or otherwise disposed of except in places duly registered by the state board of pharmacy or in hospitals, clinics, dispensaries, or by duly licensed physicians. An Oregon law provided that mechanical contraceptives must bear the name and address of the distributor, the date of manufacture, and the brand name.

Coroners and Medical Examiners.—An Arkansas law established the office of state medical examiner and prescribed the powers and duties of the medical examiner with respect to investigation and autopsies. The head of the department of pathology at the University of Arkansas Medical School was designated as the state medical examiner, and he was directed to establish a laboratory having adequate facilities for the conduct of autopsies and of such pathological, bacteriological, and toxicological examinations as may be necessary or proper. Two Florida laws authorized the board of commissioners of certain counties to appoint county medical examiners and set forth the duties of such office. One Alabama law directed the state toxicologist to furnish a certified copy of any investigation that he conducted to the person ordering such investigation, and another Alabama law authorized a coroner to perform autopsies upon the bodies of persons who died by violence or other causes in order to ascertain or verify the cause of death, if the coroner is a physician or surgeon. Otherwise, the coroner must apparently obtain an order of the court and then appoint some physician or surgeon to perform the autopsy. A Florida law authorized certain judges and county solicitors throughout the state to secure the services of a physician in connection with the investigation of crime. A Maine law required physicians attending a person during the last illness to give the family, or the person conducting the burial, a statement as to the cause of death. A Minnesota law increased from $6 to $12 the fee of a physician called by a coroner to perform an autopsy. A New Jersey law authorized county physicians to perform autopsies or to direct some physician duly licensed in the state to do so when in the opinion of the county physician an autopsy is necessary to determine the cause of death.

Laboratories.—A Connecticut law directed the state department of health to maintain laboratories and bureaus of administration, vital statistics, preventable diseases, sanitary engineering, maternal and child hygiene, public health nursing, public health instruction, venereal disease, mental hygiene, and industrial hygiene. A Wisconsin law required certification by the state board of health of any laboratory established and operated to perform bacteriological, biological, serological, and related services. A Pennsylvania law authorized the state department of health to issue licenses to persons desiring to operate clinopathological laboratories, which were defined as places operated by one or more persons for the study of blood, urine, feces, and other secretions and excretions and parts of the human body, such as tumors removed for examinations in connection with the study of possible diseases in the living patient.

Medical Research Programs.—A West Virginia law created a revolving fund to be used for scientific and other research under contract with the federal government.

Medical Schools and Scholarships.—Laws authorizing the establishment of new medical schools were enacted in Florida, Maine, North Dakota, and West Virginia. New laws in Massachusetts and Rhode Island created special committees to make a thorough study concerning the feasibility of establishing a medical school at Rhode Island State College. An Illinois resolution requested an amendment to the rules of the College of Medicine of the University of Illinois in order to provide for the annual admittance of at least 20 students who will agree to practice in the rural areas of the state. A Georgia law provided that there shall be submitted to the voters of the state a resolution recommending the creation of a state medical education board to receive and pass upon, allow, or disallow applications for loans or scholarships made by students who are bona fide citizens and residents of the state and who desire to become doctors of medicine and who are acceptable for enrollment in a qualified four-year medical school. A Texas law proposed an amendment to the Constitution providing for the establishment of a state medical education board and a state medical scholarship fund, from which grants, loans, or scholarships may be made to students desiring to study medicine, providing such students shall agree to practice in rural areas of the state.

Paternity Tests.—A Pennsylvania law provided that in any proceeding to establish paternity, the court on motion of defendant shall order the mother, her child, and the defendant to submit to one or more blood grouping tests by a duly qualified physician to determine whether the defendant can be excluded as being the father of the child and that the results of such tests may be received in evidence in cases where definite exclusion of the defendant is established.

Miscellaneous Legislation

Antidiscrimination.—An Oregon law made it unlawful for any professional school chartered or licensed in the state to refuse admission to or to discriminate in admission against or to discriminate in giving instruction to any person otherwise qualified on the ground of such person's race, color, religion, or national origin.

Multiple Boards of Health.—Laws permitting the establishment of consolidated or multiple county health departments were enacted in New Jersey, Pennsylvania, South Dakota, and Wyoming.

State Boards of Health.—New laws relating to the powers of the state board or department of health were enacted in Arizona, Delaware, South Dakota, Utah, and Vermont and a Maryland law permitted chiropractors to receive free services along with physicians from the public health laboratory.

Surveys.—A Minnesota law provided for the creation of a commission to make a survey of the manner in which responsibility for the treatment and control of tuberculosis is now shared in the state as well as a survey of the facilities for the diagnosis, treatment, and control of tuberculosis in the state. A New York law created a legislative committee to make a study and survey of the social, educational, and physical problems of persons affected with cerebral palsy. A Wisconsin law provided an appropriation for the study of and research into the causes, prevention, and cure of rheumatism and arthritis and for the purchase of necessary apparatus, equipment, and supplies to carry out such study and research. A Michigan law provided an appropriation to tuberculosis hospitals and provided for conducting a survey of the state as far as its need for hospital services is concerned. A number of other laws relating to various types of surveys were enacted during the last legislative season. The following committees and studies were provided for: California—a temporary committee to study voluntary plans of hospital and health insurance and prepaid medical, surgical, hospital, and other services respectively; an interim committee to study and analyze all matters relating to or affecting public health; a committee to study and analyze all facts relating to a shortage of nurses. Georgia—a committee to investigate the procedure for admission now in effect at the university school of medicine to determine if Georgia boys and girls are given preference in being admitted to such school over out-of-state students. Illinois—a committee to study the need for the establishment of a hospital in Chicago for the treatment of patients with acute mental disease; a special committee to investigate why the city of Chicago has not utilized the facilities of the Municipal Contagious Disease Hospital for the treatment of persons afflicted with tuberculosis. Maryland—a committee to review the Maryland mental health program. Massachusetts—a study and investigation relative to the advisability of providing psychiatric services and facilities to the district courts; a commission to make a study relating to the sentencing, treatment, and release of female prisoners in penal institutions; a study by the committee on public health relative to the licensing of certain hospitals and nursing homes, relative to the matter of handling and disposing of radioactive materials and the use of apparatus emitting ionizing radiation and relative to regulating the practice of electrolysis. Michigan—a committee to study the laws of the state governing drug addicts. Minnesota—a commission to study and analyze all the facts and matters relating to youth conservation and mental health programs in the state. Ohio—a committee to make inquiries pertaining to the state examining boards. South Carolina—a committee to investigate unemployment insurance rates. Tennessee—a commission to study and investigate plans to provide hospitalization and medical care and treatment for indigent and sick persons financially unable to provide the same. Vermont—a commission to investigate the conditions existing at the Vermont state hospital. Wisconsin—a committee to study the problem of need for medical facilities and personnel in needy areas of the state, with special emphasis on the possibilities of establishing community clinics in such areas; a committee to survey the sanitation and safety problems of the public schools.

Taxes.—A Minnesota law authorized the deduction under the state income tax law of premiums paid for hospitalization and health and accident insurance.

Microfilms.—An Alabama law authorized the commissioner of public welfare to microfilm his records and provided that such microfilms would be admissible evidence in court. A New York law also permitted the use in court of photographic reproductions of hospital records.

Vendor of Medical Care.—A Minnesota law defined the term vendor of medical care to mean any person furnishing within the scope of his respective license any or all of the following goods or services: medical, surgical, hospital, optical, dental, nursing services, drugs and medical supplies, appliances, laboratory, diagnostic, and therapeutic services, nursing home and convalescent care, and such other medical services or supplies provided or prescribed by persons authorized by state law to give such services and supplies.

COUNCIL ON MEDICAL EDUCATION AND HOSPITALS

RESIDENCY INFORMATION SERVICE

A list of residency appointments available in approved hospitals through Jan. 1, 1953, is now ready for distribution and will be furnished to interested physicians and institutions on request. These lists provide information regarding the number of positions open, date available, the name of the chief of service, the stipend paid, maintenance furnished, and the name of the person to whom application should be made; in addition, the lists indicate those hospitals that will consider applications from graduates of medical schools outside the United States. The lists are classified by specialties. Unless the complete reprint is requested, therefore, a list of available positions in a particular specialty or specialties will be furnished. Physicians desiring this information should indicate the specialty or specialties in which they are interested.

It should be noted that this service is made available directly to prospective applicants on their request and is not published in The Journal. Complete data on all approved services will continue to be published in the Internship and Residency Number of The Journal. Physicians and institutions wishing to utilize this service, either to secure a list of available appointments or to list positions open in subsequent revisions, should write to: Residency Information Service, 535 North Dearborn Street, Chicago 10, Ill.

MEDICAL LITERATURE ABSTRACTS

UNITED STATES

A.M.A. Arch. Indust. Hyg. & Occup. Med., Chicago

5:97-184 (Feb.) 1952

CONFERENCE ON PROBLEMS OF NOISE IN INDUSTRY

Sound and Its Measurement. L. L. Beranek.—p. 97.
Industrial Plant Environmental Study. C. R. Williams.—p. 109.
Estimating Percentage Loss of Hearing. H. A. Carter.—p. 113.
Noise Safety Criteria. K. D. Kryter.—p. 117.
Ear Lesions Caused by Acoustic Trauma. S. R. Guild.—p. 121.
Clinical Aspects of Problems of Noise in Industry. H. P. House.—p. 124.
Noise and Noise Reduction: Control Methods Applied. W. D. Boynton.—p. 129.
Legal Aspects of Occupational Deafness. N. S. Symons.—p. 138.
Medical and Legal Aspects of Noise in Industry: Discussion of Papers Presented. G. D. Hoople.—p. 157.
Summary of Conference on Problems of Noise in Industry. W. A. Rosenblith.—p. 160.

A.M.A. Arch. Neurology and Psychiatry, Chicago

67:135-268 (Feb.) 1952

SYMPOSIUM ON BRAIN AND MIND

Notes on Cortical Evolution. G. von Bonin.—p. 135.
Ascending Reticular Activating System in Brain Stem. H. W. Magoun.—p. 145.
Corticofugal Projections to Brain Stem. H. Jasper, C. Ajmone-Marsan and J. Stoll.—p. 155.
Nature and Locus of Mind. S. Cobb.—p. 172.
Memory Mechanisms. W. Penfield.—p. 178.
Consciousness Reconsidered. F. Schiller.—p. 199.
*Blood Eosinophilic Leucocytes in Mental Disease. M. D. Altschule, E. P. Siegel, R. M. Restaino and B. H. Parkhurst.—p. 228.
*Cerebellar Hemangioblastomas: Review of 53 Cases, with Special Reference to Cerebellar Cysts and Association of Polycythemia. F. Cramer and W. Kimsey.—p. 237.

Blood Eosinophils in Mental Disease.—Altschule and associates made blood eosinophil counts on 25 normal subjects, 244 patients with untreated mental disturbances, and 118 patients who were treated with insulin or electroshock. The influence of pregnancy on the eosinophil count was studied in 2 women, and the effects of intramuscular injection of 0.01 mg. of epinephrine hydrochloride per kilogram of body weight were studied in 44 patients with various disorders. It was found that the eosinophil count of venous blood is usually low in patients with severe neuroses or manic depressive, involutional, or schizophrenic psychoses; when these conditions are of long duration, the counts are less likely to be low. After treatment with insulin or electroshock therapy, the count usually rises in patients who show improvement and usually does not change significantly in patients who do not. Several sources of error prevent the use of the blood eosinophil count as a diagnostic aid or as an indicator of the adequacy of shock treatment. The eosinophil counts in the two psychotic pregnant women were in the range described by others for nonpsychotic pregnant women. The eosinopenic response to epinephrine in the patients with mental disorders was similar to that found in many other chronic illnesses; treatment has no consistent effect on this reaction. The authors feel that the results of their studies are consistent with the concept that severe neuroses and schizophrenic, manic depressive, and involutional psychoses are associated with an increase in some adrenocortical functions and that recovery is associated with depression of these functions. Whether the changes found result from the disease or from a factor that is the cause of the mental disease has not been established.

Cerebellar Hemangioblastomas.—Cushing and Bailey believed that xanthochromic cysts of the cerebellum that were not definitely associated with gliomas were of hemangioblastomatous origin. To establish their relation to hemangioblastomas, Cramer and Kimsey analyzed the cerebellar cysts they observed over the past 20 years, including 48 surgically verified cerebellar hemangioblastomas or hemangioblastomatous cysts and 5 disclosed at autopsy. Over 80% of the patients were between 20 and 50 years of age. The tumors were classified as "solid," "solid with cysts," and "cysts." Symptoms of increased intracranial pressure predominated, headache being the first symptom in over 90% of the cases. Headache was associated more frequently with solid tumors than with cysts. Papilledema was found in 40 cases. Cerebellar signs, such as ataxia, adiadochokinesia, and unsteady stance, were third in frequency. Vomiting occurred in 29 cases, and papilledema was present in 27 of these. Vertigo occurred in 25 and tinnitus in 8 cases. A total of 70 operations were performed in the 48 patients, the operations being multiple in 12 cases. The mortality in single stage operations was 8.3%, and in multiple stage operations, 18.1%. The histories of patients undergoing multiple stage operations are presented, because they permit a view of different stages of the cystic cerebellar hemangioblastoma. In relatively few cases, the stigmas were associated with the von Hippel-Lindau syndrome, the incidence being about the same as in Cushing and Bailey's series. The length of survival and freedom from symptoms is directly proportional to the degree of removal of the tumor, and possibly to the degree of removal of the cyst wall. The cerebellar hemangioblastomas arise from multicentric anlages. Recurrence of symptom is often due to the growth of new tumors. The recurrence of symptoms after the complete evacuation of a cyst with no mural nodule and the finding of another cyst subsequently are probably due to the growth, degeneration, and/or exudation from vessels of another tumor, and not to the simple refilling of the first cyst. The sudden recurrence of symptoms in the course of a hemangioblastoma may be a sign of acute hemorrhage into the cerebellum. The association of polycythemia rubra with vascular tumors suggests that the polycythemia may result from hematopoietic functions of these hemangioblastomas. However, it may represent merely a diathesis toward extramedullary erythropoiesis in the spleen and liver. Future observations on this type of tumor must include more extensive studies on the red blood cells in the general circulation, as well as on those within the hemangioblastomas. Tissue cultures in one case here reported gave suggestive evidence of erythropoiesis.

A.M.A. Arch. Otolaryngology, Chicago

55:101-260 (Feb.) 1952

Diagnosis of Deafness in the Very Young Child. F. R. Guilford and C. O. Haug.—p. 101.
Loudness Perception for Pure Tones and for Speech. J. D. Harris, H. L. Haines and C. K. Myers.—p. 107.
Structure and Function of Cochlear Aqueduct. J. Lempert, P. E. Meltzer, E. G. Wever and others.—p. 134.
The Adenoid Problem. P. Guggenheim.—p. 146.
Painful Ear Nodule. R. W. Thometz.—p. 153.
Effects of Aspiration in External Ear Canal. N. Torok.—p. 157.
Mastoidectomy: New Supra-Auricular Approach to Middle Ear. E. Gutteridge.—p. 163.
Congenital Atresia of Auditory Canal: Two-Stage Operation with Fenestration. D. G. Woodman.—p. 172.
Intranasal Encephaloceles: Survey of Problem, with Recommendations for Reducing Mortality. E. Walker, W. W. Moore and J. R. Simpson.—p. 182.
Notes on Innervation of Cochlea. E. Bocca.—p. 188.
Chronic Progressive Deafness, Including Otosclerosis and Diseases of Inner Ear. A. L. Juers, E. L. Derlacki and G. E. Schambaugh Jr.—p. 218.

Periodicals on file in the Library of the American Medical Association may be borrowed by members of the Association or its student organization and by individual subscribers, provided they reside in continental United States or Canada. Requests for periodicals should be addressed "Library, American Medical Association." Periodical files cover only the last 11 years, and no photoduplication services are available. No charge is made to members, but the fee for other borrowers is 15 cents in stamps for each item. Only three periodicals may be borrowed at one time, and they must not be kept longer than five days. Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted.

A.M.A. Arch. Pathology, Chicago

53:103-196 (Feb.) 1952

Granulomatous Encephalomyelitis in Infancy. J. P. Wyatt and W. W. Tribby.—p. 103.
Dissecting Aneurysm of Aorta: Pathologic Aspects; Analysis of 85 Fatal Cases. I. Gore and V. J. Seiwert.—p. 121.
Pathogenesis of Dissecting Aneurysm of Aorta. I. Gore.—p. 142.
Accumulation of Fat in Liver with Deficiencies of Threonine and of Lysine. F. Dick Jr., W. K. Hall, V. P. Sydenstricker and others. —p. 154.
Ovarian Stromal Hyperplasia in Breast Cancer. S. C. Sommers and H. A. Teloh.—p. 160.
•Mycosis of Cervical Spinal Cord Following Intrathecal Penicillin Therapy: Report of Case Simulating Cord Tumor. R. E. Wybel.—p. 167.
Rachitic Changes in Vertebral Bodies. R. C. Hendrix.—p. 174.
Alkaline Phosphatase Activity of Kidney Following Experimental Shock in Dogs by Clostridium Perfrigens Toxin. M. Berg and S. A. Levinson. —p. 179.

Mycosis of Spinal Cord Following Intrathecal Therapy.—Mycotic infections have been observed in patients treated with antibiotics. Wybel reports a fatal case of mycotic granuloma of the leptomeninges of the cervical spinal cord that was probably due to Aspergillus. The clinical course simulated that of a spinal cord tumor. The fungus may have been introduced as a contaminant during treatment of a pneumococcic meningitis with intrathecal injections of penicillin three years prior to death. It is believed that this is the first reported case of mycotic infection of the meninges associated with or following the intrathecal administration of penicillin. Evidence is cited from the literature that indicates that the growth of the fungus was enhanced by the penicillin therapy. This complication should be added to the long list of dangers associated with the intrathecal administration of penicillin and other antibiotics.

Alabama State Medical Assn. Journal, Montgomery

21:213-248 (Feb.) 1952

Management of Anesthetic Emergencies. A. Habeeb and C. A. Nelson Jr. —p. 213.
Galactosemia. C. K. Pitt.—p. 220.
Efficacy of Various Solutions Used in Injection Treatment of Internal Hemorrhoids. M. H. Dodson.—p 227.
Surgery in Treatment of Pulmonary Tuberculosis. J. P. Chapman Jr. —p. 230.
Method of Treating Paraphimosis. T. H. Williams and R. K. Nichols. —p. 233.

American Heart Journal, St. Louis

43:161-320 (Feb.) 1952

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Cardiac Involvement in Progressive Muscular Dystrophy. S. Weisenfeld and W. J. Messinger.—p. 170.
Hydraulic Formula for Calculation of Cross-Sectional Area of Mitral Valve During Regurgitation. R. Gorlin and L. Dexter.—p. 188.
Alterations of Rapid Filling Phase in Congestive Heart Failure. H. E. Heyer, C. H. Howard, K. W. Willis and A. C. Pickle.—p. 206.
Water and Electrolyte Content of Cardiac and Skeletal Muscle in Heart Failure and Myocardial Infarction. L. T. Iseri, L. C. Alexander, R. S. McCaughey and others.—p. 215.
Variation of P-R Interval in Sinus Arrhythmia and Its Possible Relation to Wenckebach Phenomenon. O. F. Ehrentheil, M. M. Alimurung and B. F. Massell.—p. 228.
Positional Changes in QAVF and Esophageal Leads Induced by Pneumoperitoneum. I. L. Rubin and W. Most.—p. 236.
Intraventricular Pressure and Electrocardiographic Recordings of Dying Rabbit Heart. F. R. Franke, R. S. George and S. Cohen.—p. 246.
•Use of Pharmacological Tests in Diagnosis of Pheochromocytoma. W. H. Anderson, L. S. Rolufs and A. A. Doerner.—p. 252.
•Intra-Arterial Infusion in Treatment of Shock Resulting from Coronary Occlusion. E. F. Berman and L. C. Akman.—p. 264.
Isolated Traumatic Rupture of Interventricular Septum Due to Blunt Force. B. E. Pollock, R. A. Markelz and H. E. Shuey.—p. 273.
Rheumatic Carditis in Surgically Removed Auricular Appendages. M. Kuschner, I. Ferrer, R. M. Harvey and R. H. Wylie.—p. 286.

Pharmacologic Tests in Pheochromocytoma.—The diagnosis of pheochromocytoma in a man aged 35 was suggested by the almost daily recurrence of severe throbbing frontal headache, blood pressure of 190/128 mm. Hg, an increase in blood pressure to 230/150 mm. Hg following massage in the left upper quadrant of the abdomen, albuminuria (410 mg. per 100 cc.), and a fasting blood sugar level varying from 85 to 136 mg. per 100 cc. Excretory urography revealed poor function on the left side. The diagnosis of pheochromocytoma was established preoperatively by pharmacologic tests. The benzodioxane test was carried out twice, with 20 mg. of the drug given intravenously, and was negative on each occasion. It may be that the benzodioxane was not injected at a time when the patient manifested an excess of circulating epinephrine. This suggestion is supported by the fact that benzodioxane depressed the blood pressure following tumor manipulation at operation. The histamine test was strongly positive, the reaction to the intravenous injection of 0.025 mg. being more severe than any spontaneous attack. The tetraethylammonium chloride test was performed twice. The patient first was given 100 mg. doses intravenously at two minute intervals until 400 mg. had been given. This was followed by a drop of 20 mm. in the systolic blood pressure and of 10 mm. in the diastolic. The following day he was given 400 mg. intravenously in a single injection and a typical pressor response followed, with maximal effect four minutes after the injection. These observations supported the concept that tetraethylammonium chloride potentiates both pressor and depressor substances due to block of sympathetic ganglions and the carotid and aortic regulatory ganglions. The result of the methacholine (mecholyl®) chloride test was negative, as was the cold pressor test. The amobarbital sodium sedation test was carried out by giving 7½ grains (0.5 gm.) of amobarbital sodium orally; the pressure dropped in one hour from 160/80 to 135/78 mm. of mercury. Since the pharmacologic tests confirmed the clinical impression, the patient was operated on and a tumor was found at the upper pole of the left kidney partially surrounded by adrenal tissue. It was successfully removed, and microscopic examination revealed a benign pheochromocytoma of the adrenal gland. It is concluded that a battery of pharmacologic tests has a useful place in the diagnosis of pheochromocytoma.

Intra-Arterial Infusion in Treatment of Shock.—Eight patients between the ages of 47 and 78 in severe to profound shock of from three to 28 hours' duration following myocardial infarction from coronary occlusion were treated with intra-arterial infusion. Up to 1,000 cc. of blood or plasma were given at a rate, generally, of 75 to 100 cc. per minute. Six of these patients showed evidence of improvement as manifested by the heart sounds, respirations, degree of pain, and electrocardiographic tracings. Elevation of blood pressure occurred in four patients in whom infusion seemed effective in enabling them to survive critical periods of shock for eight hours, 11 and 14 days, and 10 months. There was no increase in pulmonary congestion during the infusion, but one patient developed ventricular fibrillation shortly after infusion. Results improved as greater facility in technique was achieved. Arterial hypotension is the only constant clinical feature of coronary shock. Congestive heart failure may or may not be present, but its frequent presence or appearance emphasizes the limited reserve of the circulatory system under these conditions. Intra-arterial infusion in myocardial infarction is less likely than intravenous infusion to increase or precipitate congestive heart failure. Its applicability does not depend on the venous circulation, nor does it abrogate steps in correcting venous dynamics. Intra-arterial infusion, in addition to combating shock with the least volume of fluid, has the singular action of increasing coronary flow by retrograde effect. The authors' results seem to justify the use of intra-arterial infusion in patients with postcoronary hypotension who have not progressed to such profound shock and imminent death as those reported on. Although the limited experience with intra-arterial infusion in coronary shock seems encouraging, the extremely serious nature and depleted reserve of the patients call for utmost caution in its application.

American Journal of Psychotherapy, New York

6:1-242 (Jan.) 1952. **Partial Index**

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Insecurity in Search of Security. B. Karpman.—p. 23.
Anti-Psychoanalytic Cultural Forces in Development of Western Civilization. S. Arieti.—p. 63.
Early Married Life. D. J. Salfield.—p. 79.
Psychological Effects of School Segregation. F. Wertham.—p. 94.
Limitations of Teacher in Guidance. S. Baron.—p. 104.

Journal Clin. Endocrin. & Metab., Springfield, Ill.

12:1-142 (Jan.) 1952

Comparison of Effectiveness of Three Testosterone Preparations in Man and Rats. E. P. McCullagh, J. B. R. McKendry and C. A. Schaffenburg.—p. 3.
Testosterone *β*-*Cyclopentylpropionate*: New Long-Acting Androgen. A. C. Ott, M. H. Kuizenga, S. C. Lyster and B. A. Johnson.—p. 15.
Relative Duration of Action of Natural and Synthetic Estrogens Administered Parenterally in Women with Estrogen *Deficiency*. J. Ferin. —p. 28.
Eosinophil Response to Stress of Patients with *Surgically Produced* Thalamic and Hypothalamic Lesions. W. H. Perloff, L. M. Levy and A. Despopoulos.—p. 36.
Hormone-Resistant Psychogenic Amenorrhea. M. A. Goldzieher and J. W. Goldzieher.—p. 42.
Adrenal Cortical Tumor Causing Hirsutism Without Other Evidence of Virilization. L. W. Kinsell and H. Lisser.—p. 50.
Determination of *Urinary* Steroids: I. Preparation of Pigment-Free Extracts and *Simplified Procedure for Estimation* of *Total 17-Ketosteroids.* I. J. Drekter, A. Heisler, G. R. Scism and others.—p. 55.
Clinical Method for Chromatographic-Colorimetric Determination of Urinary 17-Ketosteroids: II. Normal Adults. E. Dingemanse, L. G. Huis in 't Veld and E. L. Hartogh-Katz.—p. 66.
Critical Analysis of Quantitative I^{131} Therapy of Thyrotoxicosis. A. S. Freedberg, G. S. Kurland, D. L. Chamovitz and A. L. Ureles.—p. 86.
*Treatment of Nodular Goiter. L. Hermanson, S. L. Gargill and M. F. Lesses.—p. 112.
Present Status of Treatment of Toxic Goiter. W. O. Thompson.—p. 130.

Treatment of Nodular Goiter.—In this study of data on 200 patients operated on for nodular goiter, it was possible to determine the exact degree and extent of the nodularity in 190. In 137 patients the goiter was judged clinically to contain a solitary nodule, but complete examination of the excised specimen revealed that 43 of *these goiters were multinodular.* Both single and multiple nodules were found in 18 clinically nonnodular thyroid glands. This throws considerable doubt on the *clinical differentiation* of solitary from multinodular goiter. The *incidence* of malignant neoplasms was 12.5% in the entire series; 14.4% of the solitary nodules were malignant neoplasms. In 10.4% of the patients with multinodular goiters, *malignant neoplasms* occurred in one or more of the nodules. Thyroid cancer occurred as an unexpected finding in patients with asymptomatic nodular goiter. Twenty-five *patients with malignancy* of the thyroid were followed for periods of from one to 17 years; 21 of these patients had papillary carcinoma or angioinvasive adenoma. Only two patients died during a follow-up period that averaged *seven years.* Routine radical neck dissection in thyroid cancer does not appear to be justified. Adequate surgery should consist of unilateral total lobectomy or bilateral thyroidectomy, *depending* on *the nature* and extent of the lesion. Radical neck dissection is indicated when there is transcapsular spread. Injuries to the recurrent laryngeal nerves occur in a significant number of operations for *nodular goiter, and are related to the* type of operation *performed.*

Journal of International College of Surgeons, Chicago

17:135-270 (Feb.) 1952

Surgical Management of Secondary and Absolute Glaucoma, with Special Reference to Cycloelectrolysis. C. Berens and L. J. Girard.—p. 135.
Menacing Specter of Chronic Aural Suppuration. F. L. Lederer.—p. 154.
Maxillofacial Triad and Its Correction, with Special Reference to Nasal Septum. I. B. Goldman.—p. 167.
Effects of Surgery of Inferior Oblique Muscle on Lateral Deviation. W. E. Krewson III.—p. 181.
Occupational Injuries of Eye and Their Treatment: Medications. W. B. Matthew.—p. 187.
Eye *Problems in Boxing*. C. H. Albaugh.—p. 191.
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Superficial Keratectomy: Technic of Corneal Resection for Restoration of Vision with Use of Binocular Dissecting Microscope. R. A. Perritt. —p. 220.
Electrocoagulation of Tonsils. F. L. Wahrer.—p. 224.
Diseases *of* Nose and Nasal Accessory Sinuses in Relation to Eye. L. Savitt.—p. 227.
Ophthalmologic Developments Under Field and War Conditions. R. I. Pritikin.—p. 234.
Otorhinologic Surgical Problems in Biochemical Era. S. F. Kelley. —p. 240.

Journal of Investigative Dermatology, Baltimore

18:1-86 (Jan.) 1952

*Adrenocorticotrophic Hormone *in* Severe Anogenital Pruritus. J. L. Fromer and F. E. Cormia.—p. 1.
Results of Skin *Tests in* Contacts of Blastomycotic Patients. J. Schwarz and G. L. Baum.—p. 3.
*Treatment of *Alopecia Areata Totalis* and Universalis with Cortisone Acetate. C. J. Dillaha and S. Rothman.—p. 5.
Some *Endocrine Aspects* of *Skin Senitizations* and Primary Irritation. A. Nilzen.—p. 7.
Studies on Peripheral Vascular *Physiology* of Patients with Atopic Dermatitis. W. H. Eyster Jr., G. M. Roth and R. R. Kierland.—p. 37.
Effect of Ions on *Melanin Formation.* A. B. Lerner.—p. 47.
Attempts at Passive Transfer *of* Allergic Eczematous Sensitivity *in* Man. R. L. Baer *and M. B.* Sulzberger.—p. 53.
New Clearing Method Permitting Same Specimen to be Examined Microscopically for Pathogenic Fungi and Directly Inoculated into Culture Media. E. H. Mandel, E. Muskatblit, A. G. Franks and F. Herrmann. —p. 61.
Studies on Sweating: V. Studies of Quantity and Distribution of Thermogenic Sweat Delivery to *Skin.* F. Herrmann, P. H. Prose and M. B. Sulzberger.—p. 71.

Adrenocorticotropic Hormone in Anogenital Pruritus.—The first of the four patients in whom adrenocorticotropic hormone was tried had had anogenital *pruritus* for 20 years. Various treatments, including the use of local medication, antihistaminic agents, and roentgen rays, had proved ineffective. Treatment with corticotropin was begun with a dose of 100 mg. daily for three days, *then* 50 mg. daily for three days, and after that a maintenance dose of 10 mg. *The* pruritus showed improvement within 24 hours *after the* onset of treatment and subsided completely after three days. There was no recurrence during the four *months that have elapsed since then. In the three other patients the immediate* effect of corticotropin was equally favorable, but one of these patients had a relapse after two months. The author is unable to explain *the mode of action of corticotropin in* anogenital pruritus.

Cortisone Acetate in Alopecia Areata.—The following observa*tions* have suggested that hormonal factors may play an accessory role in alopecia areata: regrowth of hair during pregnancy and recurrence of alopecia with reestablishment of the menses; the onset of alopecia sometimes concurrently with thyrotoxicosis; and the fact that it is more severe if it begins before puberty. The reasoning that led Hench and associates to the use of corticotropin and cortisone in *rheumatoid arthritis* prompted the present authors to try cortisone in patients with alopecia areata. They found that three of four patients with long-standing alopecia areata responded to oral treatment *with cortisone acetate. In* the one patient who did not respond, the disease had appeared before puberty. In the other three patients new hair began to grow after four weeks of *treatment.* This uniformity of response, as well as the fact that the disease in all three cases was present for five or more years without any tendency to spontaneous remission, is regarded as proof that the regrowth was coincident with therapy. All three patients are still under treatment, and hair growth is progressing.

Journal of Neurosurgery, Springfield, Ill.

9:1-114 (Jan.) 1952

*Fat Embolism: Problem in Differential Diagnosis of Craniocerebral Trauma. R. C. Schneider.—p. 1.
*Study of Causes of Failure in Herniated Intervertebral Disc Operation: Analysis of 67 Reoperated Cases. J. Greenwood Jr., T. H. McGuire and F. Kimbell.—p. 15.
Procaine Block of Frontal Lobe White Fibers as Means of Predicting Effect of Prefrontal Lobotomy: I. Experimental Studies. O. T. Bailey, W. T. Small and F. D. Ingraham.—p. 21.
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Recovery from Decerebrate *State* Associated with Supratentorial Space-Taking Lesions. H. Freedman.—p. 52.
Hydrocephalus from *Overproduction* of Cerebrospinal Fluid (and Experiences with Other Papillomas of Choroid Plexus). E. A. Kahn and J. T. Luros.—p. 59.
Effects of Intracarotid Diodrast. E. L. Foltz, L. B. Thomas and A. A. Ward Jr.—p. 68.
Tissue Reactions to Powdered Tantalum in Central Nervous System. O. T. Bailey, F. D. Ingraham, P. S. Weadon and A. F. Susen.—p. 83.

Fat Embolism and Craniocerebral Trauma.—Fat embolism must be considered in patients who have received lacerations or long bone fractures concomitantly with head injuries. *Within six* months Schneider observed *three patients* with fat embolism. In addition to fracture of long bones, the tentative diagnoses in these cases were extradural hemorrhage, subdural clot, and midbrain injury, respectively. In the first of the three cases mental confusion and lethargy occurred about 12 hours after the accident and a short time after a cast had been applied to the leg, suggesting the possibility of emboli. Fat globules were found in the urine 60 hours after the accident. Nine days after the injury temperature elevation with tonic seizures of the extremities indicated the release of another shower of fatty emboli to the brain stem or the vicinity of the basal ganglia. A dilated right pupil with bilateral extensor plantar reflexes suggested the formation of a tentorial pressure cone due to a rapidly expanding right temporoparietal extradural hematoma. If such a case is observed until there are changes in vital signs, the patient may succumb before operation can be performed. Therefore, trephination was indicated despite a diagnosis of fat embolism, because extradural hematoma and fat embolism might coexist. The history of the second case suggested the presence of a subdural hematoma over the left hemisphere. However, other signs suggested that the lesion was diffuse rather than localized. Because of the fracture of the left humerus and the author's experience in the first case, the urine was tested for fat droplets, and the diagnosis of fat embolism was confirmed Thus the patient was spared unnecessary trephination. The third patient had a neurological pattern suggesting midbrain damage, although the same pattern may be seen in cases in which petechial hemorrhages have occurred in the region of the basal ganglia. In this case the treatment was the same for the lesion due to trauma as for diffuse fat embolism. The latter diagnosis was suspected, but could not be demonstrated until postmortem examination. After discussing the signs, symptoms and laboratory test for fat embolism, the author says that the most important point is to think of fat embolism. If there is any doubt about an intracranial clot and cerebral fat embolus, trephination should be carried out.

Failure in Disk Operations: Analysis of Cases with Second Operations.—Of 632 patients operated upon by Greenwood and associates for herniated disk, 58 had second operations. Nine others who had a second operation received their first surgical treatment elsewhere. This total of 67 includes 10 patients reoperated on while they were still in the hospital and 16 who had a second herniation in an entirely different location. Many were operated on after several years of complete relief before recurrence of pain necessitated a second procedure. Thus in only 32 cases can the need for a second operation be ascribed to failure of the first operation. A review of these 67 cases showed that the operation for lumbar disk herniations is not primarily an operation on the disk injury, but an operation on the nerve roots involved. Reoperation is a worth-while procedure if this fact is recognized, and will further reduce the small group of failures. In addition, knowledge gained may reduce the number of patients who obtain incomplete relief and need a second procedure. It is emphasized that the opening through which the nerve root must pass should be at least 50% larger than the root itself; that there should be no loose pieces of cartilage left behind, above, or below the interspace, attached to the nerve root or in the intervertebral foramen; and that no nuclear material should be left in the intervertebral space. Bony prominences should be removed, or, better, gently hammered down. The results of nerve root section are fairly good. While the success of fusion is unimpressive, fusion should be done if no other direct approach seems reasonable. The worst results were obtained in cases in which there was persistent or recurrent back pain without sciatic pain.

Kentucky State Medical Assn. Journal, Bowling Green

50:1-50 (Jan.) 1952

Status of Total Gastrectomy in Treatment of Gastric Cancer. C. C. Johnston.—p. 1.
The Eye, the Patient, and the Physician. W. L. Adams.—p. 5.
Current Concepts in Management of Chronic Pelvic Inflammatory Disease with Review of Literature. G. G. Greene.—p. 8.
Use of Intramedullary Nail. G. E. McMunn.—p. 14.
*Vagotomy and Pyloroplacty: Simple Safe Solution to Bleeding Ulcer Problem. H. E. Dorton, J. G. Webb and D. M. Royalty.—p. 16.
Cough. O. O. Miller.—p. 19.

Vagotomy and Pyloroplasty for Bleeding Ulcer.—Dorton and associates used vagotomy combined with pyloroplasty in the surgical management of 10 patients who had bleeding duodenal ulcers. The results were most satisfactory. There was no surgical mortality, and there has been no recurrence of bleeding or of ulcer symptoms for an average follow-up period of 18 months. The authors feel that vagotomy and pyloroplasty is a simple, safe, and effectual method of managing any type of duodenal bleeding ulcer. It will not only control acute bleeding but also will cure the ulcer and thereby prevent subsequent bleeding. A patient who has massive hemorrhage should be considered an acute surgical emergency to be operated on as soon as provision for adequate blood substitution has been made. To wait in the hope that bleeding from a good-sized artery will stop spontaneously is dangerous. Vagotomy and pyloroplasty is the operation of choice for this condition.

Maine Medical Association Journal, Portland

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Surgical Aspects of Thyroid Disease. E. S. Judd Jr.—p. 1.
Review of Fifty Cholecystectomies. P. O. Gregory.—p. 8.
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The Pigmented Naevus of the Conjunctivae and Its Importance to the Individual. R. H. Dennis.—p. 35.
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Diagnosis and Treatment of Otitis Media. L. W. Pratt.—p. 39.
Surgical Aspects of Peripheral Arterial Disease. J. F. Reynolds.—p. 43.
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Mushroom Poisoning. E. N. Ervin.—p. 48.
Hospital Admissions—Can Admitting Procedures be Improved? F. T. Hill.—p. 49.
Role of Laboratory in Staff Development. I. I. Goodof.—p. 51.

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Minnesota Medicine, St. Paul

35:1-96 (Jan.) 1952

*Maternal Syndrome Associated with Isoimmunization and Fetal Death in Utero. I. H. Kaiser.—p. 25.
Fetal Salvage in Pregnant Diabetic Patients. T. Petrick.—p. 28.
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*Investigation into Etiology of Nausea and Vomiting of Pregnancy. I. C. Bernstein.—p. 34.
Dermatoses of Lower Extremities. I. Fisher.—p. 39.
Kyphoscoliotic Heart Disease: Report of Five Cases. E. G. Kidd and J. F. Briggs.—p. 42.
Economic Value of High Quality Milk. M. W. Clark.—p. 45.

Maternal Syndrome with Isoimmunization and Fetal Death in Utero.—Sudden weight gain with manifest edema and subsequent death of the fetus in utero characterize a striking maternal syndrome associated with grave degrees of isoimmunization. This is contrary to the assumption that isoimmunization produces no recognizable symptoms and can only be demonstrated by laboratory determination of circulating anti-Rh antibodies. Three cases are reported in which the patient had specific complaints. The common clinical features were a history of previous infant mortality due to erythroblastosis fetalis, the presence of high anti-Rh antibody titers, the sudden appearance prior to term of edema with sharp weight gain, and fetal death in utero shortly thereafter. Two patients also had severe itching, and one had symptoms indistinguishable from those of severe acute toxemia of pregnancy. No explanation for this sudden maternal hydrops has been found; careful study of patients showing this syndrome is needed as an aid to clinical management of a serious complication of pregnancy.

Etiology of Nausea and Vomiting of Pregnancy.—Psychiatric study does not support the theory that women with nausea and vomiting of pregnancy are neurotic. Individual and collective comparisons of 10 patients with the symptom and a control group of 10 patients without it revealed no essential difference in their attitudes towards pregnancy, delivery, marriage and family, children, and spouse. The similarity of reaction is explained by the common factor of pregnancy in both groups; the difference in symptoms may be explained by different vomiting thresholds or a different method of expressing feelings of rejection of pregnancy caused by complex physical changes and emotional stresses.

Missouri State Medical Assn. Journal, St. Louis

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Nebraska State Medical Journal, Lincoln

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37:29-64 (Feb.) 1952

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Recent Observations on Prognosis and Treatment of Essential Hypertension. H. J. Lehnhoff Jr.—p. 44.
Dissecting Aneurysm of Aorta: Clinicopathologic Observations in 12 Cases. B. C. Russum and W. J. Reals.—p. 46.

New England Journal of Medicine, Boston

246:115-160 (Jan. 24) 1952

*Surgical Treatment of Peptic Ulcer. F. H. Lahey and S. F. Marshall. —p. 115.
*Reversible Toxic Manifestations in Patients with Cirrhosis of Liver Given Cation-Exchange Resins. G. J. Gabuzda Jr., G. B. Phillips and C. S. Davidson.—p. 124.
Audible Auricular Heart Sounds in Auricular Flutter. J. P. Rattigan, W. W. Byrnes, H. Kraus and H. S. Sise.—p. 130.
Effect of Combined Therapy (Dihydrostreptomycin and PAS) on Emergence of Streptomycin-Resistant Strains of Tubercle Baccilli. S. J. Shane, J. H. Laurie, C. Riley and M. Boutilier.—p. 132.
Hormonal Treatment of Cancer. I. T. Nathanson and R. M. Kelley. —p. 135.

Surgical Treatment of Peptic Ulcer.—In a series of 16,000 patients with peptic ulcer 1,811 were operated on from 1931 to 1950, and 1,603 of these were subjected to partial gastrectomy. From this large experience it has been concluded that the mortality from surgical treatment of duodenal ulcer is increased in patients with repeated attacks of ulcer activity over 5 to 15 years, because of the increased hazard of removal of a chronically indurated ulcer involving the common duct or deeply eroding the head of the pancreas. Earlier partial gastrectomy in patients with duodenal ulcer under medical management is urged to lower further the mortality rate in this operation. The decision for or against operation in bleeding peptic ulcers is difficult. Surgical measures to control bleeding should be instituted when the total blood volume drops below 60%. Early decision for or against surgery in patients with recurring pyloric obstruction was made possible by Wilkinson's drainage test, which consists of introducing 3 oz. (90 cc.) of noncurding milk mixture every hour through an indwelling gastric tube, clamping the tube for the first half hour and draining it for the second half hour throughout the 24 hours for three to four days, and determining the changes in the amount of residual matter. Pancreatitis, particularly in the head of the pancreas, is a possible serious complication of partial gastrectomy for duodenal ulcer. To prevent this complication, the accessory pancreatic duct should be carefully searched for whenever the duodenum is removed from the head of the pancreas in order to obtain an adequate length for safe inversion; if seen it must be securely ligated. Introduction of needles or sutures into the head of the pancreas should be avoided. Considering the relation of gastric ulcer to malignancy, the authors feel that nearly ever ulcer arising on the greater curvature of the stomach is malignant. If a gastric ulcer does not heal completely within six weeks on conservative treatment, it should be treated as soon as possible by gastric resection. All recurrent gastric ulcers should be resected promptly. Of 13 patients with ulcers high on the lesser curvature that required total gastrectomy and who were followed for two to eight years after the operation, 12 obtained excellent results. The only patient who died had a perforated ulcer that was treated by an emergency total gastrectomy. Concerning the place of vagotomy in the surgical management of duodenal and jejunal ulcer, the authors agree with Phemister that vagotomy is the logical approach to inhibit the cephalic phase in the control of hyperacidity, when the possibility of this control by partial gastrectomy has already been exhausted by an adequate performance of the latter operation. Partial gastrectomy must be the first choice of any operative procedure for a patient with peptic ulcer.

Cation-Exchange Resins in Liver Cirrhosis.—Of 12 patients with severe cirrhosis of the liver treated for ascites and edema with cation-exchange resins, 4 were given ammonium resin, 4 hydrogen resin, and 4 ammonium potassium resin. During 18 courses of therapy with 30 to 90 gm. daily in divided doses for from 3 to 13 days, 10 of the patients had significant diuresis, with reduction in ascites and edema and loss of body weight. Neurological disturbances occurred on eight occasions in six of the eight patients receiving the ammonium resins. The disturbances first appeared on the third day of treatment and consisted of drowsiness, apathy, weakness, slurring of speech, disorientation, confusion, inappropriate behavior, and a coarse, irregular flapping tremor intensified by maintenance of posture. In two patients these changes occurred during the first course of resin, cleared promptly when resin was discontinued, and recurred on reinstitution of the resin. The tremor usually appeared first and persisted longer than the alterations in the mental state, and the changes were quickly reversed after resin was discontinued. Since the neurological complications were not concomitant with alterations in the serum sodium or potassium concentrations or with the degree of acidosis, they could not be definitely attributed to these alterations. In contrast, two patients given the hydrogen resin had typical clinical manifestations of hypokalemia and acidosis without the neurological abnormalities observed in the patients given the ammonium-containing resins. Constipation and fecal impaction occurred frequently as a complication of resin therapy. The similarity of the tremor and mental changes observed in the patients given ammonium-containing resins to the neurological manifestations of impending hepatic coma suggests a common biochemical basis. The untoward effects noted in the authors' patients indicate that the cation-exchange resins are poorly tolerated by patients with severe liver disease and should be administered cautiously if at all. These resins do not replace an adequate diet rigidly restricted in sodium content as the best method of management of ascites and edema in patients with liver disease.

New Jersey Medical Society Journal, Trenton

49:1-44 (Jan.) 1952

Some Critera for Social Maturity. C. N. Baganz.—p. 3.
Slipped Femoral Epiphysis. R. E. Humphreis.—p. 6.
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New Nitrogen Free, Hypo-Allergic Antipruritic. O. J. Sokoloff and F. M. Berger.—p. 23.
Trombo-Angiitis Obliterans in Women: Review and Report of Proved Case. N. Frank.—p. 26.
Rational Use of Cortisone in Rheumatic Diseases. I. L. Sperling.—p. 29

Pennsylvania Medical Journal, Harrisburg

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Value of Bone Marrow Studies to Clinician. W. M. Cooper.—p. 131.
Intravenous Injection of Procaine in Treatment of Pruritus Ani. L. G. Beinhauer and S. R. Perrin.—p. 133.
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Early Diagnosis of Cancer. D. W. Clare.—p. 143.
Roentgenologic Diagnosis of Peptic Ulcer: With Special Reference to Percentage Incidence of Duodenal Ulcer in Routine Gastrointestinal Examinations. S. G. Henderson.—p. 147.

Quart. Bull. Sea View Hospital, Staten Island, N. Y.

13:1-78 (Jan.) 1952

Studies on Activity of Hydrazine Derivatives of Isonicotinic Acid in Experimental Tuberculosis of Mice. E. Grunberg and R. J. Schnitzer. —p. 3.
Tuberculosis in Macacus Rhesus Treated with Isonicotinylhydrazine. I. Zieper and R. A. Lewis.—p. 12.
Toxicity of Hydrazine Derivatives of Isonicotinic Acid in Chemotherapy of Human Tuberculosis (Preliminary Report). I. J. Selikoff, E. H. Robitzer and G. G. Ornstein.—p. 17.
Chemotherapy of Human Tuberculosis with Hydrazine Derivatives of Isonicotinic Acid (Preliminary Report of Representative Cases). E. H. Robitzek, I. J. Selikoff and G. G. Ornstein.—p. 27.
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Radiology, Syracuse, N. Y.

58:1-160 (Jan.) 1952

*Osseous Lesions of Tuberous Sclerosis. J. F. Holt and W. W. Dickerson. —p. 1.
Dental Roentgenologic Manifestations of Systemic Disease: I. Endocrine Disturbances. E. C. Stafne.—p. 9.
Betatron Cancer Therapy. R. A. Harvey, L. L. Haas and J. S. Laughlin. —p. 23.
Late Sequalae Following Cancericidal Irradiation in Children: Report of Three Cases. W. T. Murphy and D. L. Berrens.—p. 35.
Beam-Directed High-Dosage Radiotherapy of Bronchogenic Carcinoma. L. R. Felton.—p. 43.
Esophagus and Mediastinal Lymphadenopathy in Bronchial Carcinoma. F. G. Fleischner.—p. 48.
Accurate Method for Measurement of Radioiodine in Thyroid Gland by External Counter. T. Fields and G. V. LeRoy.—p. 57.
*Scintillation Counter as Instrument for in Vivo Determination of Thyroid Weight. H. C. Allen Jr. and W. E. Goodwin.—p. 68.
Innominate Artery: Angiocardiographic Study. E. I. Honig, I. Steinberg and C. T. Dotter.—p. 80.
New Method for Demonstrating Aberrant Right Subclavian Artery. R. L. Raphael, T. G. Schnabel Jr. and S. S. Leopold.—p. 89.
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Radiographic Diagnosis of Hydrocolpos in Infants. L. L. Klostermyer and J. J. Thompson.—p. 100.
Anterior Sacral Meningocele. R. J. Calihan.—p. 104.
Urinary Incontinence in Women: Roentgen Manifestations. A. K. Briney and P. J. Hodes.—p. 109.

Osseous Lesions of Tuberous Sclerosis.—Holt and Dickerman group Bourneville's tuberous sclerosis with Reckinghausen's neurofibromatosis and with Sturge-Weber cephalotrigeminal angiomatosis under the general classification "hereditary congenital ectodermoses." Tuberous sclerosis gets its name from the potato-like nodules in the brain, which are the basic pathological lesions. These nodules are smooth, white, relatively hard sclerotic patches, which may project into the lateral ventricles. The nodules may calcify, particularly those in and about the basal ganglia. Patients with tuberous sclerosis present the triad of facial adenoma sebaceum, mental deficiency, and convulsions. Retinal tumors (phakomas) are just as common as they are in the other congenital ectodermoses, and renal tumors of the mixed embryonal type occur in a large proportion of cases. Defective development and tumor or cyst formation in the lungs, heart, liver, adrenals, and other structures are also seen occasionally. Tuberous sclerosis is much less common than neurofibromatosis; during a period in which approximately 180 patients with neurofibromatosis were seen, only 10 accurate diagnoses of tuberous sclerosis were made. In addition to these 10 cases, the authors had available for study 33 patients from a hospital for epileptics. A roentgenologic survey of these 43 patients with tuberous sclerosis revealed skeletal abnormalities which, though less diversified than those in neurofibromatosis. are more diagnostic in their appearance. Seventeen of 40 patients had scattered sclerotic plaques in the cranial vault and 20 of the 30 patients who had roentgen examination of the hands and feet showed localized cyst-like areas of bone destruction in the phalanges and/or wavy periosteal new bone formation along the shafts of the metatarsals and metacarpals. These osseous lesions in the extremities are so strikingly similar to each other and to illustrations in the literature that they may be considered valuable aids in diagnosis of tuberous sclerosis.

Scintillation Counter for in Vivo Determination of Thyroid Weight.—A scintillation type of radiation detector consists of a luminescent phosphor capable of transforming an appreciable fraction of the incident particle of radiation energy into luminescent light, a photomultiplier tube for converting this light into electric pulses, and the necessary electronic equipment to record these pulses. Allen and Goodwin describe the two types of scintillation counters that have been used in their laboratory and clinic over the past eight months. Because of the greatly increased sensitivity of the "wide angle" scintillation counter over the conventional end window Geiger-Müller counter for detection of gamma radiation, it has become possible to lower the tracer dose of I^{131} required for routine diagnostic thyroid surveys from between 50 and 250 μc of eight-day radioiodine to 1 μc of I^{131}. The "wide angle" scintillation counter is more than 100 times as sensitive as the end window Geiger-Müller counter, while the "directional" scintillation counter is 35 times as sensitive. When the "directional" scintillation counter is used for total uptake studies, a larger dose than 1 μc of I^{131} is required as a tracer dose. As an outlining instrument, the "directional" scintillation counter makes it possible to determine the completeness of a total or the extent of a subtotal thyroidectomy. In several cases of thyroid carcinoma, it has been possible to demonstrate paratracheal areas of radioactivity following a total thyroidectomy. The most important use of the "directional" scintillation counter at the present time, however, is for outlining the thyroid gland in thyrotoxicosis, as a means of determining thyroid weight. The determination of thyroid weight is of paramount importance in the calculation of the dose of radioiodine to be used in the treatment of this disease. Because it is now possible to determine the weight of the thyroid with a reasonable degree of accuracy, the authors no longer give a standard dose of radioiodine to every patient with hyperthyroidism, to be followed later by a second dose should the initial dose be inadequate. Instead, each dose is individualized. They feel that a single dose accurately calculated will produce a better therapeutic response than repeated small doses.

Tennessee State Medical Assn. Journal, Nashville

45:1-46 (Jan.) 1952

Bladder Irritation in the Female. C. C. Stauffer.—p. 1.
Clinical Results with Cortisone in Ophthalmology. C. King, P. Lewis and W. McKinney.—p. 5.
Prognosis in Congestive Heart Failure. R. C. Sexton Jr.—p. 10.
Repository Tubocurarine in Trauma. W. W. Hoback.—p. 16.
Disseminated Histoplasmosis. K. R. Deibert.—p. 19.
Complications of Insulin Therapy. A. B. Scoville Jr.—p. 23.

Wisconsin Medical Journal, Madison

51:1-144 (Jan.) 1952

Disability Evaluation. C. C. Schneider.—p. 35.
Wills for Physicians. W. F. Waugh.—p. 37.

51:145-236 (Feb.) 1952

Ectopic Pregnancy: Report of Three Unusual Cases and Analysis of 83 Cases at Milwaukee Hospital. F. J. Hofmeister and C. A. Hultman. —p. 166.
Comparative Evaluation of New Oral Cholecystographic Agent (Telepaque) with Priodax: Preliminary Report. J. L. Marks and J. A. Schelble.—p. 171.
Highlights in Diagnosis and Treatment of Some Common Ear, Nose, and Throat Conditions. I. Muskat.—p. 173.
Medical Problems in Atomic Exposure. G. M. Lyon.—p. 176.

FOREIGN

Archives of Disease in Childhood, London

26:477-628 (Dec.) 1951. **Partial Index**

Observations on Vitality of the Newborn. F. E. Hytten.—p. 477.
Phenylketonuria with Study of Effect upon It of Glutamic Acid. L. I. Woolf. and D. G. Vulliamy.—p. 487.
Significance of Brushfield's Spots in Diagnosis of Mongolism in Infancy. H. R. E. Wallis.——p. 495.
Epilepsy in Mongolism. B. H. Kirman.—p. 501.
*Origin of Lung Cysts in Childhood. D. J. Conway.—p. 504.
Hypopituitarism in First Cousins. D. Hubble.—p. 530.
Obesity in Child. D. Macaulay.—p. 539.
Radiological "Double Contour" Effect in Long Bones of Newly Born Infants. N. M. Hancox, J. D. Hay, W. S. Holden and others.—p. 543.
Clinical Features, Diagnosis, and Osseous Lesions of Gargoylism Exemplified in Three Siblings. W. P. U. Jackson.—p. 549.
Volume and Acidity of Gastric Contents in Unfed Newborn Infant. J. Thomson.—p. 558.
Perforated Peptic Ulcer in Mongoloid Infant Associated with Congenital Diaphragmatic Hernia. R. Spencer and M. M. Rogerson.—p. 566.
Relationship of Cystic Lesions of Acini of Pancreas to Age, Cause of Death, and Fibrocystic Disease in Children. J. L. Emery.—p. 570.
Gangrene of Forearm in the Newborn. R. J. K. Brown and S. R. N. Smith.—p. 574.
Familial Incidence of Non-Lipoid Reticulo-Endotheliosis (Letterer-Siwe Disease). A. J. M. Reese and E. Levy.—p. 578.
Auricular Septal Defect in One of Monozygotic Twins. C. C. Forsyth and I. Uchida.—p. 582.
Inclusion Disease in Childhood. N. E. France.—p. 588.
Diagnosis of Virus Pneumonia in Infants and Children. D. Macaulay. —p. 601.
Congenital Hemiatrophy of Brain. L. Crome.—p. 608.

Origin of Lung Cysts in Childhood.—Occasionally, indisputable evidence that lung cysts are congenital is provided at necropsy on a stillborn fetus, but oftener the conclusion as to whether the disease is congenital or acquired is based on embryologic and histological data supported by conjecture. In this paper a group of cases are reported in which the development of lung cysts was studied by prolonged clinical observation and serial radiography. The author does not doubt that some cysts are congenital, but the evidence he presents supports the hypothesis that most pulmonary cysts are acquired, and that they are generally the product of mechanical and inflammatory forces. Evidence of inflammation is often seen at necropsy. There are bound to be gradations from cysts due to purely mechanical factors to necrotic cavities that are entirely the result of infection. The following classification of lung cysts has been used: (1) emphysematous and interstitial bullae, blebs, and pneumatoceles; (2) lung abscess, pulmonary infarction with necrosis, and bronchial distension; (3) tuberculous cavitation; (4) multiple honeycomb lung; and (5) traumatic cysts. Cases illustrating these different types are discussed.

British Journal of Industrial Medicine, London

9:1-92 (Jan.) 1952. **Partial Index**

Rheumatism in Miners: Part I. Rheumatic Complaints. J. W. Lawrence and J. Aitken-Swan.—p. 1.
Study of Conditions Under Which Methanol May Exert Toxic Hazard in Industry. G. Leaf and L. J. Zatman.—p. 19.
Determination of Small Amounts of Tetranitromethane in Air. V. B. Vouk and O. A. Weber.—p. 32.
Clinical-Pathological Report of Eight Cases of Methyl Bromide Poisoning. J. H. Prain and G. H. Smith.—p. 44.
*Vanadium Poisoning from Cleaning Oil-Fired Boilers. N. Williams. —p. 50.
Salt Losses of Men Working in Hot Environments. J. S. Weiner and R. E. van Heyningen.—p. 56.
Penetration of Dust Particles and Sites of Dust Stores in Pneumoconiosis. G. Mottura.—p. 65.
Skin Cancer of Hand and Forearm. C. N. D. Cruickshank and A. Gourevitch.—p. 74.

Vanadium Poisoning from Cleaning Oil-Fired Boilers.—The boilers in question were those of a generating station, consuming about 150 tons (136 M.T.) of fuel oil a week. Each boiler requires cleaning once a year. It takes a gang of eight men about five days to clean a boiler, after which the bricklayers enter to dismantle the firebrick walls and build new ones. The boiler cleaning methods in use when the investigation began produced large quantities of dust. The combustion chamber was cleaned by brushing the soot off the walls, and the boiler tubes by tapping with a rod. In the superheater chamber the banks of tubes had to be cleaned by a compressed air jet from a nozzle. Dismantling the firebrick walls also produced dust, and the bricklayers complained of symptoms similar, though less severe, to those experienced by the boiler cleaners. Williams points out that the vanadium content of crude oil ash varies from as high as 45% in the Venezuelan to none in the Pennsylvanian product. An oil with an ash content of 0.1% containing 40% of vanadium pentoxide would produce 1 lb. (0.45 kg.) of vanadium pentoxide for every 11 tons (about 10 M.T.) of oil burnt. All eight men had symptoms while cleaning the boilers. The first symptoms usually occurred between a half and one hour after the work was started, but in some cases were delayed for 12 hours. They consisted of rhinorrhea, sneezing, watering of the eyes, and soreness in the throat and behind the sternum. These symptoms can be described as the primary, and the secondary symptoms, which appeared after 6 to 24 hours, were dry cough, wheezing, severe dyspnea that necessitated rest after climbing a 20 foot ladder, lassitude, and depression, with a disinclination to follow the usual activities outside working hours. A greenish-black coating developed on the tongue, which faded two to three days after contact with petroleum soot was discontinued. Some of the men noted that the cough became paroxysmal and productive. These symptoms continued at work and only became less severe three days after the work was stopped. In one man the wheezing and dyspnea persisted for over a week, but none noticed any permanent ill effects. The urine of three of the men contained vanadium, and in two of these three the symptoms were especially severe. The author suggests that methods of cleaning oil-fired boilers should be reviewed, and that men working on these boilers should be medically supervised.

British Journal of Plastic Surgery, Edinburgh

4:231-306 (Jan.) 1952

Experience in Burying Live Scars. D. A. C. Reid.—p. 235.
Repair of Flexor Tendons in Hand. B. K. Rank and A. R. Wakefield. —p. 244.
Remarks of Aetiology of Congenital Bilateral Fistulae of Lower Lip. J. G. Warbrick, J. R. McIntyre and A. G. Ferguson.—p. 254.
Surgical Treatment of Post-Radiation Recurrent Basal-Cell Carcinoma of Face and Scalp. R. Champion and R. Gibb.—p. 263.
*Exposure of Skull from Burns. S. H. Harrison.—p. 279.
New Operation for Congenital and Paralytic Ptosis. M. Sarwar.—p. 293.
Parotid-Antral Fistula. M. H. Shaw.—p. 298.

Exposure of the Skull by Burns.—Eleven cases of scalp loss are reported, 10 of which were due to burns. The cases are divided into the following four groups: (1) whole skin loss of the scalp, with intact pericranium; (2) whole skin loss of the scalp, with pericranium involved; (3) whole skin loss involving the outer plate; and (4) whole skin loss, including both plates of the skull. Although the grades frequently overlapped, the depth of the burn determined the method of treatment. Five of the 11 patients had fallen into a fire during a fit. The case histories are presented, and it is pointed out that in group 1, in which the pericranium was intact, immediate free grafting proved successful. Failure to graft immediately with this type of lesion will lead to loss of the pericranium and exposure of bone, thus converting group 1 lesions into group 2 lesions. In group 2, where bone is exposed and the pericranium has been lost, decortication of the outer plate and immediate free grafting should be carried out. A similar procedure should be followed in group 3, where the outer plate has been involved. In group 4 removal of both plates of the skull and delay of grafting until granulations have formed over the dura would seem the only rational form of treatment. Transposed flaps, when practicable, can be used to cover the defect; but in doubtful group 2 cases estimation of the depth of the burn would be advisable if transposition is contemplated as a primary procedure. In cases where the bone has been involved, the use of transposed flaps should be deferred until sequestration is complete. Decortication is performed by cutting the outer plate into small squares with an electric saw and systematically removing the outer plate with a chisel and hammer until multiple bleeding points appear. Grafts are applied immediately or may be delayed. In cases in which operation has been delayed the skull invaded by granulation tissue becomes soft and friable, and the dura may be exposed or penetrated, particularly with lesions of the type in group 3 cases; the bone in the region of the suture lines is thin, and decortication should be superficial in these areas. The middle meningeal artery, or more commonly one of its branches, may be divided and require ligation. The grafts will not take over dura, and 14 days must elapse before granulations are adequate to take a free graft.

Canadian Journal of Medical Sciences, Ottawa

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Acid Phosphatases of Human Urine. G. E. Delory and M. Hetherington.—p. 4.
Effect of Age, Sex, and Previous Pregnancy on Oxygen Uptake of Rat Mammary Tissue. J. Tuba and M. S. Fraser.—p. 14.
Relationship of Dietary Factors to Rat Serum Alkaline Phosphatase: II. Effect of Total Food Consumption, Methionine, Choline, and Vitamin B_{12} in Normal and Alloxan Diabetic Adult Rats. J. Tuba and N. B. Madsen.—p. 18.
Effect of Propylthiouracil on Weight and Concentrations of Cholesterol and Ascorbic Acid of Adrenal Gland. W. F. Perry.—p. 36.
*Radon in Normal Breath. E. J. Martin and J. K. W. Ferguson.—p. 42.
Studies on Passive Immunity in Poliomyelitis: III. Production of Immune Serum to Lansing Poliomyelitis Virus in Rhesus Monkeys. A. J. Rhodes, E. M. Clark and F. T. Shimada.—p. 54.

Radon in Normal Breath.—Under normal conditions the human body contains a certain amount of the radioactive gas, radon, which has been absorbed from the surrounding air and other sources, or has been generated from the radium in the body. Its distribution between aqueous liquids and gases is such that at equilibrium the concentration in the gaseous phase is greater. Consequently expired air is more suitable for analytical studies than blood or urine. The measurement of radon in the breath has been used extensively to estimate the amount of radium in the bodies of workers in the radium industries. Such measurements have in recent years been made by counting the alpha particles emitted per unit time by the radon and its decay products. To measure the very low radon content of the breath of individuals who have not accumulated abnormal amounts of radium in their bodies, the alpha counting equipment must be very sensitive and stable. Apparatus that satisfies these requirements has been built, and has made the present investigation possible. The radon content of the breath is close to and governed by the radon content of the atmospheric air and fluctuates with it. When the radium content of the body is increased, it contributes to the breath an increased amount of radon, which may still be within the range of the ordinary radon content of the air and therefore be veiled. By having the subjects breathe radon-free rather than atmospheric air, it is possible to investigate the content of radium in the body. It was found that when radon-free air is inhaled, the radon concentration in the expired air of normal subjects is considerably less than the concentration commonly found in "fresh" atmospheric air. The various sources of radon are discussed, and the authors state that under the conditions prevailing during their studies it appears that the radon in atmospheric air establishes a concentration of radon in the body that supplies a larger proportion of the exhaled radon than radon from all other sources put together. However, great fluctuation of the proportions may be expected, depending on local and atmospheric conditions.

East African Medical Journal, Nairobi

28:449-482 (Nov.) 1951

Two Cases of Onyalai in Uganda. H. C. Trowell.—p. 449.
*Treatment of Tropical Ulcers. H. D. O'Brien.—p. 453.
Acute Laryngo-Tracheitis. J. W. Nelson.—p. 462.

Treatment of Tropical Ulcers.—Tropical (phagedenic) ulcers cause considerable disability among workers in tropical countries. Reports from two hospitals in Tanganyika showed 2,125 new visits by ulcer patients in the outpatient department, while in the same period 258 ulcer patients were detained in hospital for an average of 27 days each. The average disability following discharge was about seven days, so that the total loss of working days and cost of hospital care is high. Patients with tropical ulcers may have loss of superficial tendons, involvement of tendons and joints in scar contractures, osteomyelitis, hyperostoses, chronic ulcers, unstable scars, and even malignant degeneration of the ulcer. Furthermore, the presence of a chronic discharging ulcer leads to secondary anemia and hypoproteinemia that leave the patient subject to intercurrent infections. Following brief remarks about the etiology and pathological aspects of tropical ulcers, the author discusses his experiences in the treatment in 368 cases of tropical ulcer. He gives particular attention to 314 patients in whom skin grafting was done, and concludes that treatment by infrequent occlusive dressings and parenteral penicillin injections, combined with skin grafting, produces the best results.

Giornale Italiano di Chirurgia, Naples

7:649-728 (Oct.-Nov.) 1951. Partial Index

Venous Pressure in Varices of Lower Extremities. G. D'Errico and C. Sabbatini.—p. 649.
Complete Volvulus of Small Intestine: Two Surgical Cases. F. Lippo.—p. 655.
Thrombosis of Varices Treated with Sclerosing Method. M. Masturzo.—p. 665.
*Anesthetic Block and Resection of Right Splanchnic Nerve in Treatment of Postcholecystectomy Syndrome. G. De Luca.—p. 683.

Treatment of Postcholecystectomy Syndrome.—Repeated anesthetic infiltration and resection of the right splanchnic nerve are indicated for treatment of the postcholecystectomy syndrome. Anesthetic blocking of this nerve was performed by the author in 20 patients who had undergone cholecystectomy. Eight patients recovered, of whom four are still well after two years and two after more than one year. In one patient in whom severe pain recurred after four months of improvement, additional blocking failed, whereas a second course of infiltrations was beneficial in a patient in whom improvement had lasted three months only. The condition of six patients was not changed. Lumbar extraperitoneal resection of the right splanchnic nerve was performed in six patients in whom infiltration had had some effect. Four patients have no symptoms 25, 22, 17, and 12 months, respectively, after the operation. In two patients symptoms recurred a few days and two months, respectively, after the operation.

Journal of Mental Science, London

98:1-228 (Jan.) 1952. Partial Index

"Whither Psychiatry?" P. K. McCowan.—p. 1.
Post-Operative Syndromes in Selective Prefrontal Surgery. J. L. Beau.—p. 12.
Reflections on 100 Capital Cases Submitted to Electroencephalography. D. Hill and D. A. Pond.—p. 23.
Immediate Effects of Leucotomy on Cerebral Functions and Their Significance: Preliminary Report. R. Klein.—p. 60.
Problems in Diagnosis and Classification of Mental Disorder in Old Age: With Study of Case Material. M. Roth and J. D. Morrissey.—p. 66.
Pellagra and Nutritional Neuropathies: Neuropathological Review. D. Leigh.—p. 130.
Spectroscopic and Photo-Electric Oximetry in Schizophrenia and Other Psychiatric States. J. W. L. Doust.—p. 143.
*Sympathetic Blockade in Treatment of Anxiety States. S. Smith.—p. 161.
Effects of Ethyl Alcohol and Acetaldehyde on Maze Behaviour and Motor Co-Ordination in Rats. R. K. Carpenter and L. D. MacLeod.—p. 167.

Sympathetic Block in Anxiety States.—Seventeen patients, 12 women and 5 men, had a combination of psychological indications of anxiety and tension and somatic manifestations, such as sweating, tremor, and palpitations. All these patients had received psychotherapy before treatment with hexamethonium. Their response to hexamethonium was determined by the effect of the drug on the sympatheticotonic symptoms and signs. Four of the group were treated in the hospital and the remainder as outpatients. Each patient took one tablet (0.25 gm.) after meals twice a day for five days, then three times a day for another five days, and so on up to four or five tablets every day. It was found that the best objective results were usually obtained between the 6th and 10th weeks of such treatment. A history of a cerebral or coronary vascular incident was a contraindication to treatment. The blood pressure—the usual clinical reason for use of hexamethonium—was lowered in 11 cases. Varying degrees of improvement were seen in all patients. In some, excellent results were obtained by removing physiological disturbances, which in turn were causing the patient much anxiety. Following hexamethonium therapy most patients were far more accessible to ordinary psychotherapeutic measures than before. Toxic effects were few and relatively unimportant. It is concluded that in patients with signs of sympathetic overactivity, hexamethonium is a useful adjuvant to psychotherapy.

Lancet, London

1:271-324 (Feb. 9) 1952

Pain in Breast. H. J. B. Atkins.—p. 271.
Pain in Carcinoma of Breast. D. C. Corry.—p. 274.
*Radiography of Human Body with Radioactive Isotopes. W. V. Mayneord.—p. 276.
Psychosomatic Symptom Formation. I. Macalpine.—p. 278.
Acute Dilatation of Stomach as Late Complication of Poliomyelitis. K. K. Hussain.—p. 282.
Micro-Method for Determination of Urinary α-Ketosteroids and β-Ketosteroids by Digitonin Fractionation and Colorimetric Estimation. R. M. Haslam and W. Klyne.—p. 285.
Prevention of Infection of Thoracic Surgical Wounds by Staphylococci from the Patient's Skin, with Note on Infection of Gloves. G. K. Harrison and D. B. Cruickshank.—p. 288.
Islet-Cell Tumour of Pancreas: Report of Case. A. N. Smith and J. B. Cochran.—p. 289.

Radiography with Radioactive Isotopes.—Mayneord says that he suggested in 1950 that it might be possible to use a strong radioactive source as a radiographic focus inside the body, and thus obtain unconventional views of structures often confused by superimposition with the ordinary radiographic techniques. After explaining why many of the radioactive isotopes are unsuitable for this purpose, he shows that thulium 170 has several advantages. Thulium 170 emits gamma rays and two groups of beta rays, but much more information is required before it can be said accurately what radiation is emitted. However, there can be no doubt that the bulk of the radiation is made up of 0.084 mev of gamma rays accompanied by tne x-ray characteristic of ytterbium. Thulium 170 is obtained by placing thulium, a rare earth of the lanthanide series, in the pile and irradiating with slow neutrons. Normal thulium (stated to consist entirely of thulium 169) captures a neutron to form thulium 170. By irradiating for a year or more, it may be possible to manufacture isotopes whose activities are at least 5 curies per gm. The prolonged irradiation needed to reach this activity is related to the relatively long half-life of thulium, namely, 127 days. For preliminary experiments chips of thulium oxide, weighing only a few milligrams, were used in the bottom of a small glass tube into which they were sealed by an ebonite rod that fitted the tube. This rod has a small depression in its end, thus effectively making a point source at the bottom of the tube. To cut out the intense beta radiation, a block of "perspex" was turned so as to form a sphere enclosing the point source, the radius of the sphere being 5 mm., just sufficient to stop the beta rays. The first experiments were carried out with a dried skull. Dental and skull radiography are perhaps the first obvious applications of the new method. Preliminary calculations show that techniques using radioactive isotopes are unlikely to compete seriously with the classic radiographic techniques, but the advantages of a small source of x-radiation, free from electric mains and complex equipment, are apparent. Satisfactory photographs have been taken with thulium 170, but long exposures are necessary at present.

Medicina Clínica, Barcelona

17:349-418 (Dec.) 1951. Partial Index

*Epidemic Myalgia, Myalgic Meningitis and Coxsackie Virus. A. Pedro-Pons and P. Farreras Valentí.—p. 374.
Personal Experience with Cortisone, Corticotropin (ACTH) and Pregnenolone in Gout and Rheumatoid Arthritis. J. M. Poal.—p. 383.
Late Results of Cholecystectomy. N. Lloret-Barber.—p. 387.
Operative Cholangiography. J. Soler-Roig.—p. 388.
Meningitis Due to Hemophilus Influenzae. J. M. Sala Ginabreda.—p. 392.
Traumatic Accidents of Electroshock and Curarization. J. M. Pedrosa Roca.—p. 395.
"Surgical" or Auxiliary Skin Grafts. L. Mir y Mir.—p. 403.

Epidemic Myalgia.—Epidemic myalgia is a summer febrile infection that is common in children and young adults and rare in persons over 30 years of age. It is due to the Coxsackie virus and transmitted by direct contact with the patient. After an average incubation of two days, the disease starts suddenly with fever, symptoms of influenza, gastrointestinal disorders, and violent pain of the thoracoabdominal and diaphragmatic muscles. Pain of a neuralgic type is the predominant symptom. The pain increases on palpation of the involved muscles. The symptoms are similar to those of an acute condition of the abdomen, pleurisy, or renal colic. The disease may run a simple course or have one or two remissions and relapses. In the majority of cases the disease lasts one or two weeks, which includes the initial attack, a remission of 3 or 5 days, and a relapse. Myalgic meningitis alone or associated with or followed by orchitis and nephritis often constitute the second or third relapse. Reappearance of the acute symptoms, with ocular pain, acute headache, and moderate rigidity of the back of the neck, mark the meningeal form of the disease. The changes in the cerebrospinal fluid (lymphocytosis and positive Pandy and Nonne tests) are different from those of tuberculous meningitis and other forms of virus lymphocytic meningitis. The meningeal symptoms last from 10 to 20 days, after which they regress and disappear without sequelae. The form of the disease (myalgic, meningeal, and nervous) depends on the strain of the causative virus, which can be myotropic, meningotropic, neurotropic, or pleotropic. The neurotropic strain is rare. The pleotropic strain causes either the myalgic or the meningeal forms. The prognosis of the disease is good. The treatment is symptomatic. Intramuscular injections of opiates are indicated to control acute crises of pain. Antibiotics are of no avail. Red "prontosil" (an azosulfamide) in daily doses of 3 gm. for 7 to 12 consecutive days controls the disease. The infection is rare in Spain. The four cases reported by the author bring to seven the total number of cases observed in that country. The disease was uncomplicated in two cases, but was followed by myalgic meningitis in one case and by orchitis and petechial purpura in another case.

Practitioner, London

168-1-108 (Jan.) 1952. Partial Index

Acute Bronchitis and Pneumonia in Childhood. R. H. Dobbs.—p. 6.
Heart Disease in Childhood. D. Hubble.—p. 17.
Endocrine Disorders in Childhood. W. Gaisford.—p. 25.
Allergy in Childhood. A. G. Watkins.—p. 33.
Acute Abdomen in Childhood. C. Donald.—p. 41.
Blood Disorders in Childhood. D. Gairdner.—p. 49.
Experiences with Newer Drugs in Parkinsonism. R. B. Raffle.—p. 62.
*Unusual Complication of Sea-Sickness. S. W. Maxwell.—p. 71.
Osteopathy: Its History, Theory and Practice. I. Geikie-Cobb.—p. 72.

Unusual Complication of Sea-Sickness.—A girl, aged 21, had been on a sea trip lasting four hours. She was very seasick. About half an hour before the end of the trip she had a particularly violent bout of vomiting, during which she felt pain in both ears and became partially deaf. She could hear faintly what other people were saying, and her own voice sounded distant and smothered. The earache persisted all night but wore off in the morning. On examination of the right ear there was an oval-shaped perforation of the tympanic membrane. The left tympanic membrane showed a pouch of mucous membrane hanging down from a perforation. Five days later both perforations were healed.

Proceedings of Royal Society of Medicine, London

45:1-50 (Jan.) 1952. Partial Index

Treatment of Menorrhagia: President's Address. G. I. Strachan.—p. 7.
A Surgeon and Medical Education: President's Address. D. H. Patey.—p. 25.
Uretero-Intestinal Anastomosis: Observations on Technique and End-Results with Review of 138 Personal Cases: President's Address. A. Jacobs.—p. 33.
Some Observations on Treatment of Carcinoma of Rectum: President's Address. C. Butler.—p. 41.

Riforma Medica, Naples

66:1-28 (Jan. 5) 1952

*Surgical Treatment of Angina Pectoris. G. Pieri.—p. 1.
Aureomycin Therapy of Enterocolitis. V. Scaffidi and S. Scaletta.—p. 6.
Ratio Between Urea Clearance and Diuresis. G. Gigli, G. Muiesan and R. Rossi.—p. 12.

Surgical Treatment of Angina Pectoris.—Danielopolu's operation was performed in six patients with angina pectoris, three of whom had a mitral lesion, two mild dilatation of the arch of the aorta and mild hypertension, and one moderate hypertension. The cervical part of the sympathetic chain above the stellate ganglion, the cardiac rami of the cervical sympathetic and the cervical vagus nerve, and the rami communicantes originating from the lateral margin of the stellate ganglion were excised on the left side. Results were good in three patients. A marked improvement lasted three and one-half years in one patient, one is still well after nine years, and one was well for 14 months but was not followed thereafter. In two patients the treatment failed, and pain appeared in the right side of the chest. A second operation performed in these patients on this side after one year and two months, respectively, failed. The first patient died, and autopsy revealed thrombosis of the superior vena cava, subclavian vein, and right jugular vein. Severe pain reappeared in one patient five years after the first operation. The preaortic plexus was resected, and a marked improvement is present after one year. The same operation was performed in another patient in whom repeated blocks of the preaortic plexus with anesthetics were palliative only temporarily. He was able to resume his job, and is still well after 22 months. In another patient with angina pectoris resection of the left stellate ganglion failed. Thus resection of the preaortic plexus appears to be the treatment of choice.

South African Medical Journal, Cape Town

25:921-940 (Dec. 15) 1951. Partial Index

- *Typhoid Fever in South Africa: Treatment of 215 Cases Without and 139 with Chloromycetin (Chloramphenicol). H. le Riche and P. N. B. Peacock.—p. 921.
- Macular Changes in Rift Valley Fever. L. Schrire.—p. 926.
- Rift Valley Fever in Man Complicated by Retinal Changes and Loss of Vision. I. Freed.—p. 930.

Treatment of Typhoid With and Without Chloramphenicol.—As the result of a decision of the Health Department of the Union of South Africa to pay in part for the chloramphenicol used in the treatment of typhoid, the hospitals concerned were requested to submit data on the patients treated. This paper is based on 139 cases of typhoid treated with chloramphenicol in the Union of South Africa. Observations on these cases are compared with those on 215 who were treated for typhoid in 1948-1949, before chloramphenicol became available. While the mortality rate was lower in the group treated with chloramphenicol than in the controls, the difference was not statistically significant. The group treated with chloramphenicol spent an average of 28.8 days in the hospital, while the control group was hospitalized for an average of 36.5 days. This difference is regarded as statistically significant. The average dose of chloramphenicol was 14.6 gm. The average number of days of fever for the chloramphenicol group was 6.3, against 22 for the control group. There were more relapses in the group treated with chloramphenicol than in the control group, but there was a statistically significant lowering of the rate of complications in the chloramphenicol group. There is no evidence that chloramphenicol either decreases the carrier rate, or cures chronic carriers.

Tidsskrift for Den Norske Laegerforening, Oslo

71:787-830 (Dec. 15) 1951. Partial Index

- *Hemolytic Syndrome. K. Aas.—p. 787.
- Problems in Geriatrics. P. Hanssen.—p. 798.
- Surgical Treatment of Acute Stenosis of Larynx. S. Quist-Hanssen. —p. 801.
- Treatment of Varices. B. Fretheim.—p. 803.
- Care of Alcoholic Addicts. A. Kanter.—p. 808.

Hemolytic Syndrome.—Three cardinal symptoms—anemia, jaundice, and enlarged spleen—are usually present in the more marked forms of the hemolytic syndrome. The course in hemolytic diseases is often chronic, occasionally interrupted by acute aggravations. In some cases the disorder is acute, with a fulminant course and fatal outcome within a few days. In many cases the course is so mild that there are periods without anemia or jaundice. In the first of the three main groups of hemolytic diseases a defect in the erythrocyte itself is the most important cause. The group includes familial hemolytic jaundice, also called congenital hemolytic anemia or hereditary spherocytosis. The spherocytes persist after splenectomy, but the operation is effective, as the most important site of stagnation for the red blood corpuscles is removed. While congenital hemolytic anemia generally has a benign chronic course, crises endangering life may occur, with rapidly falling blood values. In this group are also sickle cell anemia, Cooley's anemia, paroxysmal nocturnal hemoglobinuria, and some other hereditary hemolytic disorders. The second main group consists of acquired hemolytic anemias due to exogenous factors, toxins of various kinds, or the occurrence of pathologic agglutinins or hemolysins. Included here are the acute hemolytic syndromes that appear in transfusion of incompatible blood and the hemolytic syndrome in the newborn. A sensitizing substance can be established by Coombs' test. There is usually a shifting chronic course, sometimes with crises threatening life. Splenectomy may result in recovery or improvement. The third important group is made up of hemolytic anemias with a course resembling that in the immunologic type, but with negative Coombs' reaction. Examination of 22 patients with anemia connected with different basic diseases revealed a hemolytic mechanism in 16. There is believed to be a primary splenogenic destruction of normal red blood corpuscles. Splenectomy may have a good effect. It has already been performed in 5 of the 16 patients, with complete recovery in 2 and improvement in 2; one patient died of acute heart failure. Splenectomy is contraindicated in cases with myelofibrosis. All patients with hemolytic syndromes will at times require blood transfusion. Blood typing often presents difficulties because of autoagglutination. Transfusion of blood corpuscles alone and not plasma has been found to be advantageous and is the method now mainly used in the Rikshospital. In all three main forms of the hemolytic syndrome splenectomy is the most important treatment. Recurrence after splenectomy may be due to an accessory spleen, which must eventually also be removed. Since treatment with bishydroxycoumarin (dicumarol®) from the day after operation was started at the Rikshospital, there has been no case of thrombosis or embolism after splenectomy. Roentgen treatment of an enlarged spleen may at times be effective. Treatment with iron, liver extracts, vitamin B_{12}, and folic acid is usually ineffective. Corticotropin (ACTH) and cortisone can have an excellent effect in certain cases, especially pre and postoperatively.

Ugeskrift for Laeger, Copenhagen

113:1687-1726 (Dec. 13) 1951. Partial Index

- *Twenty-Four Cases of Myelomatosis. B. F. Andersen.—p. 1687.
- Myelophthisic Anemia as Terminal Phase in Polycythemia Vera. Long-Continued Roentgen Treatment Followed by Myelosclerotic Syndrome. E. Roelsen and A. S. Ohlsen.—p. 1691.
- Paroxysmal Nocturnal Hemoglobinuria and Observations on Specific Test. H. Letman.—p. 1698.
- Simple Spontaneous Pneumothorax Treated with Talcum Powdering. P. B. Petersen.—p. 1699.
- Anemia Gravis Myeloblastica Infantum: A Case in a 10-Month-Old Girl Twin. O. Birn, O. Perbøll and A. S. Ohlsen.—p. 1706.
- Case of Bishydroxycoumarin ("Synparin") Intoxication Treated with Vitamin K and Blood Transfusion. Ø. Petersen.—p. 1709.

Twenty-Four Cases of Myelomatosis.—In 24 cases of myelomatosis treated from 1938 to 1951, there were 17 men and 7 women, aged from 38 to 70. The average duration of life after admission was eight months, and was the same for men and women. The temperature was usually normal, but in 13 cases it was occasionally subnormal. In 20 cases there was pain at the start, in three pain began after a couple of months, and in one case there was no pain. Normochromic anemia was almost always present. The erythrocyte sedimentation rate in myelomatosis may vary greatly in a short time. It is not related to the duration of life and cannot be used in prognosis. There seems to be a relation between albuminuria and sedimentation rates in that Andersen always found Bence-Jones protein and albumin in the urine of patients with low sedimentation rates. Hyperproteinemia was frequent. The roentgenologic changes, seen in 21 of 23 patients examined, in two cases consisted of halisteresis of the spine and in 19 varied from single to numerous roundish clear areas. Extensive roentgenologic changes appeared mainly in the patients with longer duration of life. The renal function was greatly reduced in 9 of 13 patients examined. In five cases no specific therapy was applied, as the patients were moribund on admission; in 15 roentgen treatment was given, and in four, combined roentgen and "stilbamidine" (4,4′ stilbenedicarboxamidine) treatment was given. There was good effect on the pain in six of the cases in which roentgen treatment was given, lessening of the pain in two cases after combined roentgen and "stilbamidine" treatment, and no effect in two. Diagnosis is particularly difficult in patients with lower sedimentation rates, but examination of the urine for Bence-Jones reaction is helpful.

BOOK REVIEWS

The Auricular Arrhythmias. By Myron Prinzmetal, M.D., and others. Cloth. $16.50. Pp. 387, with 323 illustrations. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill.; Blackwell Scientific Publications, Ltd., 49 Broad St., Oxford, England; Ryerson Press, 299 Queen St., W., Toronto 2B, 1952.

This well-written monograph records the extensive investigations on the nature of auricular arrhythmias of a well-coordinated research team whose work began in 1947. How much toil and effort must have been required is indicated in the dedication of the book: "To our neglected families without whose devotion this work would have been impossible."

For well over 30 years, English and American clinicians, teachers, and research workers have generally accepted Sir Thomas Lewis' interpretation of auricular flutter and fibrillation as being caused by circus movement. The Viennese school, however, never accepted the circus movement hypothesis. With newer, improved techniques, which include the use of a high-speed cinematograph, a dual beam cathode ray oscillograph, and a multichannel electrocardiograph, these investigators set out to reinvestigate the nature of auricular arrhythmias in the experimental animal and man. The data they derived, presented in detail in this book, led them to conclude that all auricular rhythms, other than a sinus rhythm, are caused by the discharge of an ectopic focus, the rate of discharge determining the rhythm. Thus, in the experimental animal with a rate below 300 per minute, auricular paroxysmal tachycardia is recorded on the electrocardiogram; with a rate between 300 to 400 per minute, there is auricular flutter; and with a rate exceeding 400 per minute, there is auricular fibrillation.

Although the evidence presented for the unitary nature of auricular arrhythmias is convincing, the authors rightly point out that further research is required, because many questions are still unanswered. Recent experimental work by other investigators lends support to the circus movement theory of auricular flutter and even suggests that two types of flutter may at times coexist in an auricle, one caused by rapid excitation of an ectopic focus and the other caused by circus movement. This monograph will certainly stimulate research in a field that has been dormant for many years.

The book is well illustrated; however, as the authors point out, the still photographs cannot convey the information with the same clarity as the slow motion moving picture films. Teachers, clinicians, and research workers in the field of cardiology should add this excellent book to their libraries.

Clinical Practice in Infectious Diseases for Students, Practitioners and Medical Officers. By E. H. R. Harries, M.D., F.R.C.P., Medical Superintendent, City Hospitals for Infectious Diseases, and University Clinical Lecturer on Fevers, Birmingham, and M. Mitman, M.D., F.R.C.P., Consultant Physician and Medical Superintendent, River Hospitals, Joyce Green, Dartford. With collaboration of Ian Taylor, M.D., M.R.C.P., Senior Medical Officer (Infectious Diseases), Public Health Department, London County Council, London. Fourth edition. Cloth. $6.50. Pp. 717, with 48 illustrations. Williams & Wilkins Company, Mount Royal and Guilford Aves., Baltimore 2, 1951.

This English textbook has now gone into its fourth edition in 11 years. It grew out of a series of clinical lectures to medical students who were expected to serve as public health officers later in their careers. Since the course in infectious diseases often serves as an introduction to clinical medicine, the approach, particularly in the early chapters, is a simple but basic one. The general principles of infection and resistance, the modes of transmission of infectious disease, and the development of immunity and hypersensitivity are covered in the early chapters. The general clinical response of the patient is then discussed with emphasis on the natural history of infectious disease. A chapter on differential diagnosis of eruptions and rashes is followed by a short chapter on laboratory aids and diagnosis.

Specific infectious diseases are then taken up in separate chapters. The specific diseases are discussed from the standpoint of epidemiology, the etiological agent, pathological findings, clinical features, complications, diagnostic aids, and differential diagnosis followed by treatment. In some of the diseases the course, complications, and prognosis are covered separately. The chapter on diphtheria is especially noteworthy. The section on serum disease seems unnecessarily long in view of the decreasing use of serum. The section on rickettsial disease discusses endemic and epidemic typhus, Q fever, and rickettsial pox, but omits Rocky Mountain spotted fever, one of the most important and severe rickettsial infections.

Good use is made of charts, tables, and color diagrams illustrating the principles of disease discussed in the text. The use of italicized words throughout the text to emphasize and contrast various features is helpful in quickly locating facts. The sections on general measures such as rest, diet, and nursing care are excellent. The general principles of chemotherapy are covered chiefly in the section on sulfonamide drugs, while the antibiotics have received less attention. The bibliography is not extensive, but the references have been well selected and have been brought up to 1949. The book should be a good one for medical students and house officers.

Essentials of Neurosurgery. By Leslie C. Oliver, F.R.C.S., Neurosurgeon, West End Hospital for Nervous Diseases, London. Cloth. 25s. Pp. 198, with 50 illustrations. H. K. Lewis & Co., Ltd., 136 Gower St., London, W.C.1, 1952.

This is an elementary and rather superficial presentation of the subject of neurological surgery. It discusses operative technique, anesthesia, and the symptomatology and treatment of the various conditions confronting the neurosurgeon. The book presents nothing new except the brief concluding discussion on the surgical treatment of Parkinsonism. The author states that section of the lateral corticospinal or pyramidal tract in the cervical spinal cord has failed to give permanent relief from the tremor. This is in accord with the observations of Olivecrona, Le Beau, and others. Oliver now advocates an almost complete hemisection of the spinal cord for this purpose.

This book is similar to, but less complete than, the one by Loyal Davis published in this country. More detailed information is to be found in the books by Percival Bailey and by Ernest Sachs on intracranial tumors, the section by Walter Dandy in Lewis' "Practice of Surgery," and the volume on the technique of neurological surgery by Bancroft and Pilcher.

For the most part American neurosurgeons would not disagree with what Oliver has to say. But a few statements must be questioned. There is no evidence that the ventricles are capable of contracting (page 14), that increased intracranial pressure is frequently associated with exophthalmos (page 46), that tumors of the cerebellar vermis cause dysarthria (page 71), that epilepsy is a common complication of closed head injuries (page 127), that peptic ulcers arise as a result of closed head injuries (page 127), or that vitallium is not well tolerated by the tissues (page 135). One is glad to learn, after years of reading of the frequency of tuberculoma of the brain in England, that this is no longer the case (pages 16 and 78). One could hardly agree that "diodone," which is known as diodrast® in the United States, is not irritating to the tissues (page 18). Most American neurosurgeons would not agree that the scalp should be prepared the night before the operation (page 26) or that a wound should be drained if the possibility of a postoperative hemorrhage is feared (page 32). A medulloblastoma is not the type of tumor one would be most likely to find in the cerebellum of a 19-year-old girl (page 16), and astrocytomas are found in the cerebellums of children far more often than in adults (page 74). Von Hippel's disease (page 74) is angiomatosis retinae; Lindau described the association of Von Hippel's disease and hemangioblastoma of the cerebellum. The statement that the pain of tic douloureux is accompanied by contraction of the facial musculature is mis-

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The reviews here published have been prepared by competent authorities and do not represent the opinions of any official bodies unless specifically stated.

leading. Tic-like or spasmodic contractions of the face do not occur; the only facial movement is the grimacing induced by the pain. Surprisingly, glossopharyngeal neuralgia is not mentioned. Few American neurosurgeons would agree that the management of head injuries is incomplete without the utilization of electroencephalography. The symptomatology of tumors of the foramèn magnum is most inadequately presented.

The book is attractively printed, and the illustrations are well reproduced.

Rehabilitation Nursing. By Alice B. Morrissey, B.S., R.N. Instructor in Rehabilitation Nursing, New York University-Bellevue Medical Center, New York. Foreword by Howard A. Rusk, M.D., Professor and Chairman of Department of Physical Medicine and Rehabilitation, New York University-Bellevue Medical Center. Cloth. $5. Pp. 299, with 58 illustrations. G. P. Putnam's Sons, 210 Madison Ave., New York, 1951.

This book is addressed to nurses in the hope that they will accept the challenge that rehabilitation offers to the nursing profession. The author has served in various teaching, supervisory, and administrative positions in the nursing field and is now a supervisor and instructor at the rehabilitation center at Bellevue Hospital. This book was written to provide some means for accomplishing the ultimate aim of rehabilitation, that is, the restoration of the handicapped person to the fullest physical, mental, social, vocational, and economic usefulness of which he is capable. The author feels that the means to accomplish this end are to acquire knowledge of the content of nursing care in rehabilitation, to develop an ability to teach the principles of rehabilitation nursing, to extend the practice of rehabilitation nursing into every area of nursing care, and to educate the public to accept the concept of rehabilitation.

The book is divided into three major parts. The first part, on the meaning of rehabilitation, takes up the history and philosophy of rehabilitation, statistics on the incidence and disability in the United States, and the nurse's role in rehabilitation. In the second part, on nursing principles and procedures in rehabilitation, nursing measures for the prevention and care of physical deformities and decubitus ulcers, procedures for bladder and bowel rehabilitation, techniques of crutch walking, care and use of mechanical leg braces, speech rehabilitation, and other subjects are discussed. The third part is devoted to the care of the amputee, the hemiplegic, the paraplegic, and the quadriplegic patient. Each chapter is followed by a bibliography. The material is presented essentially in narrative form with numerous case histories.

This book is recommended as a reference source for all nurses, —graduates and students alike. It gives a sound intellectual basis for the concept that rehabilitation is an integral part of all medical and nursing care.

The Physician as Man of Letters, Science and Action. By Thomas Kirkpatrick Monro, M.A., M.D., LL.D. Second edition. Cloth. $4.50. Pp. 259. Williams & Wilkins Company, Mount Royal and Guilford Aves., Baltimore 2, 1951.

The second edition of this book consists of an expanded compilation of pithy biographical sketches of physicians who distinguished themselves in ways other than in the practice of medicine. Although most of the biographies hold more interest for the English than for the American reader, one looks in vain for mention of two physician-writers who, born in the British Isles, are household names in the English-American reading world, namely W. Somerset Maugham and A. J. Cronin, and for the inclusion of Harvey Cushing among the sparse group of American medical men. In general, however, this book serves as a useful and readable source of concentrated information.

Of Little Patients. By Renée Zindwer. Boards. $1.95. No pagination, with illustrations. John Knox Press, Box 1176, Richmond 9, Virginia, 1952.

This book contains about two dozen vignettes of little patients the author has met in her medical practice. A hand drawing by the author of each child faces a short verbal sketch on the opposite page. She succeeds in capturing the individuality of personality and physical characteristics of the children in the drawings. The sketches, written with sympathetic and humorous insight, provide light, amusing reading. This excellent little book, handsomely bound and printed, is made to order for the physician's waiting room.

Medizinische Toxikologie: Lehrbuch für Ärzte, Apotheker und Chemiker. Von Prof. Dr. phil. et med. H. Fühner. Neu bearbeitet von Prof. Dr. phil., Dr. med. W. Wirth und Dr. med. G. Hecht, Third edition. Cloth. 21.60 marks. Pp. 251. Georg Thieme, Diemershaldenstrasse 47, (14a) Stuttgart O; agents for U. S. A., Grune & Stratton, Inc., 381 Fourth Ave., New York 16, 1951.

Although the basic structure of Fuhner's first edition has not been altered, considerable revision and additions have been made because of the introduction of many new toxic compounds and because much new material has been published regarding treatment. Material less important or obsolete has been eliminated, as are references, so that the size of the book has not been materially changed. The type is convenient for comfortable reading, and errors are remarkably few.

The text is divided into "General Toxicology," "Inorganic Poisons," and "Organic Poisons." General toxicology, concerning theories, classification, and basic treatment, is succinctly discussed, much as is found in other similar books. While inorganic poisons are grouped under the heading of each element, it is necessary to first consult the index, which is complete, to find where a particular poison may be discussed. Such is also true for the organic substances. While the authors have included many of the most recent drugs the list lacks an American flavor in that amobarbital and pentobarbital are not mentioned. The authors state that heroin is snuffed in America.

The function of the book is to acquaint physicians and medical students with substances toxic to man, and the authors have accomplished this end with conciseness and clarity. It is not nor was it intended to be encyclopedic. Diagnosis and treatment of intoxications are emphasized. Sectional headings are in bold type for ready reference. The book can be recommended to those who wish a quick reference regarding most of the common poisons.

A History of the Theories of Aether and Electricity: The Classical Theories. By Sir Edmund Whittaker, F.R.S. Cloth. $12. Pp. 434. Philosophical Library, Inc., 15 E. 40th St., New York 16; Thos. Nelson & Sons, Ltd., Parkside Works, Dalkeith Road, Edinburgh 9; 3 Henrietta St., London, W.C.2, 1951.

This is the first volume of a work discussing the changing concepts of a luminiferous ether and the efforts of physicists to develop mathematical descriptions of the electrical, magnetic, and gravitational tensions that pervade so-called empty space. As the author says, it seems absurd to apply the word "vacuum" to anything so rich and paradoxical in its properties as this medium through which material particles act on each other. If it were not for the peculiar properties of this ether, there would be no hope, for instance, of preventing the occasionally troublesome interference of television with diathermy. The first volume summarizes the pre-Einsteinian developments with the aid of partial differential equations and vector analysis. This will discourage the majority of medical readers, but it arouses curiosity, tinged with misgivings, as to the second volume, which will probably require non-Euclidean geometry and tensor calculus. It must, however, be commended as scholarly, accurate, and, in the nonmathematical passages, fascinating.

Ciba Foundation Conference on Isotopes in Biochemistry. Consulting editors: J. N. Davidson, M.D., D.Sc., F.R.S.E., and others. Editor for Ciba Foundation: G. E. W. Wolstenholme, O.B.E., M.A., M.B. Cloth. $5. Pp. 288, with 79 illustrations. Blakiston Company (division of Doubleday & Company, Inc.), 1012 Walnut St., Philadelphia 5, 1951.

This small volume consists of 22 papers read at a symposium in London in March, 1951. Each paper concludes with a résumé of the discussion that followed its reading. The symposium was attended by 78 leading isotope experts, about half of them from Great Britain, with representation from other European countries, the United States, Canada, and South America.

The subject matter of the book is divided into six sections: (1) steroids, (2) hemoglobin and metabolic derivatives, (3) the use of tracers in the study of biologic effects of radiation, (4) nucleic acids, (5) proteins and amino acids, and (6) carbohydrate and fatty acid metabolism. These topics are reviewed in detail, the book being useful primarily to research workers in the isotope field or others contemplating the use of these techniques in their research. There is little to interest general practitioners, except those seeking an authoritative summary of actual biochemical investigations in sufficient detail to permit an evaluation of the usefulness of isotope techniques.

QUERIES AND MINOR NOTES

MEASLES VERSUS RUBELLA

To the Editor:—*Our city currently has a high incidence of both measles and rubella. I have never found the differential diagnosis so difficult as this year. Some children have a rash characteristic of measles yet show the swollen lymph nodes of rubella. Some children are only slightly sick and have a rash that looks like rubella, yet the lymph node enlargement is absent. The picture has probably been made more complicated by the frequent injections of gamma globulin. The differential diagnosis, of course, is of the greatest importance where a pregnant woman is involved. I will deeply appreciate an authoritative opinion. The supply of gamma globulin is too short to allow its use for diagnostic purposes.*

M.D., Massachusetts.

Answer.—The problem described is one that is being encountered frequently. Although enlarged postauricular glands are regarded as one of the diagnostic points in rubella, that sign is not always present; however, under such circumstances swelling and tenderness of postcervical glands can usually be detected. As a rule the character of the eruption will determine the diagnosis. The glandular involvement should serve as confirmatory evidence, although many children have one or more enlarged cervical lymph nodes under conditions that are otherwise normal. But, on account of the extensive use of gamma globulin, a measles rash may be so modified that a differential diagnosis is extremely perplexing. If there is a reliable past history of measles this disease should be excluded. If Koplick spots are found a diagnosis of measles is established. It is probable that the majority of the population who have lived in the city since infancy had measles before reaching adult age. In spite of the significance of rubella, one should not attribute to rubella every rash that appears on a pregnant woman.

PERIODIC EPILEPTIC SEIZURES

To the Editor:—*A 64-year-old white woman has had grand mal and, occasionally, petit mal epileptiform seizures for 43 years. Examination reveals no abnormal physical or laboratory findings. Her seizures began during her first pregnancy and have continued since then, occurring at monthly intervals at about the time her period would be due. On one occasion, she was free from attack for about three months. The attacks are always preceded by two days of hemoptysis. Menses started when she was 13 years old, and the menopause occurred at the age of 54. There has been no apparent change since the menopause. Diphenylhydantoin (dilantin®) sodium and phenobarbital sodium have controlled the severity of the seizures to some extent. I would appreciate suggestions.*

R. G. Hickerson, M.D., Galesburg, Ill.

Answer.—Periodicity characterizes the seizures of many epileptics, and, when this occurs in women, association with the menstrual period is common. In what way the premenstrual hormonal interplay acts to precipitate attacks has not been adequately studied. In this patient, the continuance of monthly seizures long after the menopause suggests that a natural periodicity was most influential; however the preictal days of hemoptysis are more unusual and difficult to explain. Additional details, such as the duration of this phenomenon, the volume of blood, and evidence of a pulmonary lesion, are desirable. Hormone therapy would seem useless at the patient's age. The dosage of drugs used is not mentioned. An increase in this, or the substitution of mesantoin® (3-methyl-5,5-phenylethylhydantoin) for diphenylhydantoin may be advisable.

PROSTHETIC EARS

To the Editor:—*A 23-year-old man has, since babyhood, undergone about 14 operations for formation of an external ear, which was lacking at birth. At present, he has a large piece of tubular tissue transplant attached and growing about the ear canal. He has been seen by many plastic surgeons and it seems impossible to get any two who agree on what should be done. Are prosthetic ears satisfactory?*

Guy B. Griffin, M.D., Orange, N. J.

Answer.—It is clear that 14 plastic surgery procedures have created a scarred base. Further surgical procedures would thereby be jeopardized. A prosthetic ear, made of some acrylic base would now be appropriate. Latex rubber has also been employed, but it has generally been replaced by the newer materials. Materials can be applied by utilizing the remaining skin. No tissue should be sacrificed, in this instance, until the prosthetic technician is consulted. Such ears are artificial and must naturally be accepted as such. The ears may be made in colors that match the patient's skin. They are held in place by various gum mastic types of preparation.

DIAPHRAGMATIC HERNIA

To the Editor:—*A youth 16 years old was found to have a diaphragmatic hernia during a routine roentgen examination of school children. Apparently, he had no symptoms, but, since the examination, he complains of pain in the epigastrium at intervals. Should he be referred for surgery at once, or should he wait for more symptoms to occur? What are the usual symptoms?*

M.D., Mississippi.

Answer.—Asymptomatic diaphragmatic hernia in a 16-year-old boy is usually congenital in origin. In the absence of symptoms or evidence of complications, the problem should be considered one for elective surgery, which should be performed as soon as possible. To await the symptoms of complications may be unwise. With elective repair there is a low mortality rate and little morbidity; however, in the presence of complications such as strangulation of the herniated viscus, surgical treatment becomes serious. Likewise, there is evidence to suggest incomplete development of a collapsed lung when a large hernia is present from birth.

In the congenital hernia caused by absence of a portion of the diaphragm, symptoms are usually those of respiratory embarrassment, secondary to pulmonary compression or mediastinal deviation. Less commonly, the symptoms of intermittent bowel obstruction may occur, and, rarely, there may be actual strangulation of the colon or small bowel. There is no satisfactory therapy for a congenital lesion other than surgical correction.

DIABETES INSIPIDUS DURING PREGNANCY

To the Editor:—*A patient has had diabetes insipidus during three pregnancies, with complete relief of symptoms during the intervals between pregnancies. She is now early in her fourth pregnancy. I would appreciate any therapeutic suggestions.*

James T. Nix, M.D., New Orleans.

Answer.—Transient attacks of true diabetes insipidus are extremely rare, and it would be well to establish the diagnosis in this case, particularly since therapy involves the use of powerful uterine stimulants. One would expect the passage of large amounts of dilute (specific gravity 1.001 to 1.005) but otherwise normal urine, i. e., 8 to 12 liters in a 24 hour period, with corresponding thirst and resulting ingestion of unusual quantities of liquids. Evidence of consequent dehydration may be present.

It is believed that this disease is produced by a disturbance in the normal hypophyseal-hypothalamic relationship, resulting in a loss of vasopressin and oxytocin and a disappearance of the

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The answers here published have been prepared by competent authorities. They do not, however, represent the opinions of any official bodies unless specifically stated in the reply. Anonymous communications and queries on postal cards cannot be answered. Every letter must contain the writer's name and address, but these will be omitted on request.

normal antidiuretic action of the former, which controls tubular reabsorption of water in the kidney. The presence of antidiuretic hormone may be demonstrated by the injection of hypertonic sodium chloride during water diuresis (Hickey, R. C., and Hare, K.: Renal Excretion of Chloride and Water in Diabetes Insipidus, *J. Clin. Investigation* **23**:768, 1944). Inhibition of the diuresis indicates normal function; failure to inhibit is an indication of diabetes insipidus.

If the diagnosis has been substantiated and if the symptoms cause extreme inconvenience, loss of sleep, dehydration, and impairment of general health, specific therapy may be instituted. This consists of posterior pituitary (pituitrin®) administered either by subcutaneous injection or by the more convenient method of nasal insufflation of the powdered drug. Minimal initial doses should be used and gradually increased, commensurate with alleviation of symptoms, in an attempt to maintain normal physiological equilibrium and prevent overdosage. The danger of producing uterine irritability and/or contractions must be constantly considered and frequent observations should be made, with subsequent adjustment of dosage.

NUTRITIVE VALUE OF PROCESSED MEATS

To the Editor:—*What food elements are deficient in processed meats, such as "Spam," frankfurters, and scrapple, that can be found in fresh meats?*

Hugh W. S. Powers, M.D., Dallas, Texas.

Answer.—The nutrient losses in the three products mentioned, "Spam," frankfurters, and scrapple, are due chiefly to cooking losses, which occur both at home and in the food plant. According to Bowes and Church, the composition of scrapple, frankfurters, and luncheon meat, in terms of grams of each substance per 100 gm., is as follows:

	Scrapple	Frankfurters	Luncheon Meat
Protein	8.2	14.0	15.3
Fat	15.8	20.0	22.7
Carbohydrate	45.6	2.0	1.7
Calcium	0.007	0.006	0.02
Phosphorus	0.114	0.05	0.170
Iron	0.001	0.0012	0.0013
Vitamin A	175 IU	....	....
Vitamin B_1	.000146	.000160	.000367
Niacin	.0009	.0024	.0037

d-AMPHETAMINE SULFATE AND LIBIDO

To the Editor:—*I have noticed in treating obese patients for whom I prescribed d-amphetamine (dexedrine®) sulfate drugs, with or without mild sedatives, there is a diminution or loss of libido and potency. What can be done to prevent this? Libido and potency return on cessation of therapy.*

M.D., Pennsylvania.

Answer.—There is no evidence that *d*-amphetamine sulfate has significant alterative effect on the libido in normal persons. Even when administered over prolonged periods, *d*-amphetamine sulfate has no appreciable effect on the sexual function. Also, there have been no studies that substantiate the possibility that this preparation causes impotency. In special cases, where the libido is in a state of disequilibrium, an increase or decrease of libido is sometimes noted. Korns and Randall (*Ann. Int. Med.* **12**:253-255 [Aug.] 1938) report the case of a patient with orthostatic hypotension who complained of lack of libido. In this instance, a daily maintenance dose of amphetamine (benzedrine®) sulfate, taken for the hypotension, restored libido to normal. Shorvon (*Brit. J. Addict.* **44**:58-63 [July] 1947) noted that the administration of the amphetamines to aggressive psychopaths reduced libido and aggressiveness to normal.

The improvement of mood associated with *d*-amphetamine sulfate therapy and changes in the attitude of the patient toward his surroundings may lead the patient to attribute an increase or decrease in libido to this drug. There is no direct physiological action, and changes reported by normal patients must be regarded as subjective. A similar misinterpretation by the patient might occur with dexamyl,® a drug combining *d*-amphetamine sulfate with amobarbital (amytal®).

PROLAPSED INTERNAL HEMORRHOIDS

To the Editor:—*A woman, 51 years old, complains of mild depression, occasional dragging pains in right and left lower quadrants, and severe constipation with incomplete rectal emptying, even after use of laxatives. There is a sensation of spasm and, sometimes, severe pain high in the rectum. There is also pain radiating down the legs on straining and a degree of nervousness. Examination shows prolapsed internal hemorrhoids of fairly severe degree. Proctoscopic examination, aside from hemorrhoids, showed the rectum to be normal. Gastrointestinal series shows hypersecretion and hypermotility of the stomach, a small area of partial spasm high up in the small intestine, and slowing-up of barium in the large intestine. Is it likely that operation on the hemorrhoids will eliminate or help the high rectal discomfort? Will it have any effect on the gastric hypermotility and hypersecretion?*

M.D., New York.

Answer.—The only apparent organic finding in this patient is that of "fairly severe prolapsed internal hemorrhoids." Internal hemorrhoids of such severity as to prolapse tend to lessen the diameter of the anal passage. Because of this factor plus the pressure of venous engorgement and the sphincter ani spasm resulting from mucosal irritation, incomplete rectal emptying may result. At least, such a sensation is imparted to the patient. While "high rectal pain" is a term difficult to evaluate in the light of the visceral innervation of the bowel, in this instance, it is conceivable that such a symptom could be of a reflex nature. The following recommendations are therefore made: (1) skillful hemorrhoidectomy, (2) antispasmodic drug therapy for what appears to be an irritable colon, (3) bowel habit regulation, and (4) discontinuance of cathartics.

The hemorrhoidectomy will have no effect on the gastric hypermotility and hypersecretion. It may very well relieve what is described as "pain in legs while straining." (Thiele, G. H.: *J. A. M. A.* **109**:1271-1274 [Oct. 16] 1937.)

BRANCHIAL CLEFT FISTULAS

To the Editor:—*I have seen two children recently with branchial fistulas. One child, one year of age, has a tiny opening just above the medial end of the right clavicle, with a variable serous discharge, usually only a drop at the opening. In the second child, aged 4, the tiny opening is 1 in. above the right clavicle, and there is usually either a tiny crust at the opening or a tiny drop of pus present. In the first child, there is a definite small swelling on the posterior fauces on the same side at about its midpoint. In the second child, there is a similar but less obvious condition. What is your opinion in the management of these patients? Should they both be treated and, if so, at what age? Is it dangerous to leave these fistulas alone?*

M.D., Canada.

Answer.—The lesions described are probably branchial cleft fistulas. A more definite diagnosis could be determined by injecting the tracts with iodized oils (lipiodol®) or sodium iodide solution to give x-ray visualization of the tracts. If this does not give a definite diagnosis, other causes for chronic draining sinuses should be ruled out by smear, culture, and biopsy. Branchial fistulas usually cause no symptoms in early childhood. Surgical treatment is elective and can be postponed for several years. If recurrent severe infection occurs, the dissection becomes more difficult; however, in the hands of an experienced surgeon, this is not a dangerous operation.

EXTRASYSTOLES

To the Editor:—*Can you explain the occurrence of frequent extrasystoles following excessive ingestion of sodium bicarbonate? I know that the potassium ion depresses the myocardium and I wonder whether sodium acts in a contrary manner.*

M.D., New York.

Answer.—There is no indication that sodium salts, including both bicarbonate and chloride, are factors in the production of extrasystoles. It is possible, however, that the congestive failure induced by the free use of sodium salts in a patient with limited myocardial reserve may be accompanied by the appearance of extrasystoles.

METAL FUME FEVER

To the Editor:—*What is the cause and treatment of severe lumbar pain in a 41-year-old white man, occurring frequently following welding of galvanized or brass material? Urinalysis and hemogram are normal.*

Alan M. McKaig, M.D., Red Lake Falls, Minn.

This inquiry was referred to two consultants, whose respective replies follow.—Ed.

Answer.—It is possible that this represents an atypical form of the acute clinical syndrome known as "metal fume fever," which is associated with the welding of zinc and also other metals. It is thought to be due to inhalation of finely divided particles of metal oxides produced during welding. This illness begins several hours after the exposure has ended and usually consists of general malaise, aching, chills, fever, and, frequently, respiratory symptoms, such as tightness of the chest and coughing. The temperature is usually not very high, 101 F or 102 F, and leukocytosis is common. The condition usually subsides within a few hours, and there are no residual symptoms in the case of zinc welding. If no fever, general symptoms, or leukocytosis are found during the attack, some other cause should be sought. If the materials being welded contain lead, a careful study of urinary lead excretion would be helpful. Orthopedic origin of the lumbar pain should be ruled out. The prevention of metal fume fever can be accomplished by carrying out the operation in a properly ventilated welding booth. Approved metal fume respirators will give some protection. The treatment is symptomatic.

Answer.—Any welding on surfaces previously galvanized is conducive to metal fume fever, which, in this instance, would constitute "zinc chills" or "zinc ague." In this condition, joint pains are not a prominent feature but could arise. Paroxysmal severe lumbar pain is not characteristic. The outstanding features are severe ague and malaise. From welding on brass objects, lead poisoning becomes a possibility due to lead being an impurity or additive. Joint pain could arise but perhaps never as the sole indication of lead poisoning. It is within reason to suspect that the mentioned severe lumbar pain derives from no chemical involved in the welding procedures. The best treatment for either the potential metal fume fever or lead poisoning resides in prevention of further exposure.

ADDICTION TO METHADONE

To the Editor:—*Is methadone hydrochloride as deleterious to the patient as morphine? Is it as difficult to break this addiction as that of morphine?*

M. O. Robertson, M.D., Bedford, Ind.

Answer.—It is assumed that this question is concerned with chronic intoxication (addiction) with methadone and not with the acute toxic effects of methadone. Experimentation with human volunteers has shown that methadone possesses addiction liability similar to that of morphine. In some respects, addiction to methadone is more deleterious than is addiction to morphine, since tolerance to methadone develops more slowly and is never as complete as is tolerance to morphine. For this reason, persons addicted to methadone tend to remain more sedate than patients addicted to morphine, with resultant greater impairment in their ability to carry out their usual activities. Furthermore, methadone, in the amounts used by addicts, is extremely irritating to the skin and causes marked inflammation and induration. Illness following withdrawal of methadone differs quantitatively from illness following withdrawal of morphine. It appears slowly, is never as intense as that following abstinence from morphine, and subsides slowly. Patients who have been addicted to methadone remain weak and easily fatigued for several weeks longer after withdrawal than do patients who have been addicted to morphine. For this reason, many addicts regard a methadone habit as being more difficult to "break" than a morphine habit.

Methadone will completely suppress the withdrawal symptoms in persons addicted to morphine. Because of this, the drug is widely abused by morphine addicts. When morphine addicts are attempting to obtain drugs from physicians, they may attempt to persuade the physician to prescribe methadone, stating that the drug is not an opiate but a synthetic and that it is not addicting. In support of the latter statement, they may refer to the fact that methadone withdrawal symptoms are never so severe as morphine withdrawal symptoms, not mentioning that symptoms of withdrawal from methadone are prolonged. Many addicts state that it is easier to obtain prescriptions for methadone from physicians than it is to obtain prescriptions for morphine. All physicians should, therefore, be aware of the addicting properties of methadone and should be as careful in prescribing it as they are in prescribing morphine.

HORMONES AND SEX DETERMINATION

To the Editor:—*1. Does the female normally produce male hormone? 2. Is there any time in the formation and growth of the embryo that the sex can be changed by mechanical or chemical stimulation?*

M.D., New York.

Answer.—Androgen is produced in the female by the adrenal cortex and in the male by the adrenal cortex and the interstitial cells of the testis. Androgen production is always greater in the normal male than in the normal female because of its dual origin. Excessive production of androgen in the female may occur as the result of the development of tumors or hyperplasia of the androgen producing cells. Pseudohermaphrodism may develop as a result of excessive production of androgen by the adrenals in the female early in embryonic life, but complete reversal of sex cannot be produced in this manner.

OBSTETRIC ANESTHESIA

To the Editor:—*In obstetric patients is there more immediate postpartum bleeding when the patient has enough ether to produce surgical anesthesia?*

M.D., Pennsylvania.

Answer.—Ether in a deep surgical plane of anesthesia produces relaxation of the uterine musculature. Control of postpartum bleeding depends on the contractibility and retractibility of the uterine musculature. Therefore any paralysis of the uterine musculature produced by an anesthetic agent will predispose to increased postpartum bleeding. The depth of anesthesia and the rapidity with which light planes can be obtained in order to permit recovery of the uterine musculature are very important. Also the duration of anesthesia will play a factor; the longer the anesthesia the more the bleeding.

CONGENITAL DEFECTS

To the Editor:—*I disagree with the answer given to the question concerning congenital defects in* The Journal (**148:689** *[Feb. 23] 1952). The statement is made that "a mother with one congenitally defective baby is no more likely to have a repetition than is the average patient. A mother with two defective babies is more likely to have a repetition. A woman with three defective babies is likely to have defective babies rather consistently." This answer is vague and incorrect. The birth of a malformed infant automatically increases a woman's risk in subsequent pregnancies from roughly 1 in 75 (usual incidence of malformation among all infants) to somewhere between 1 in 10 and 1 in 35 (Murphy, Record, and McKeown). Murphy's limited data on such cases suggest that the figure for women with two abnormal infants is probably 1 in 5 or 1 in 10. There are no suitable data available for women with three abnormal children, but it is logical to assume that the risk figure is about one in four. These figures relate to major malformations (where incidence is 1 in 100 or slightly less), mainly of the central nervous system. It is better to give the risk figure for specific defects if possible. The more that is known about the pregnancy and the type of malformed infant that the woman has, the more specific can one be in formulating a risk figure for her.*

Ray C. Anderson, M.D.
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